TECHNOLOGY DEPT.

Gas Journal

VOL. 275. 105TH YEAR. LONDON, AUGUST 12, 1953. NO. 4706. PRICE 1/3

MATERIALS HANDLING PLANT

for the Gas Industry

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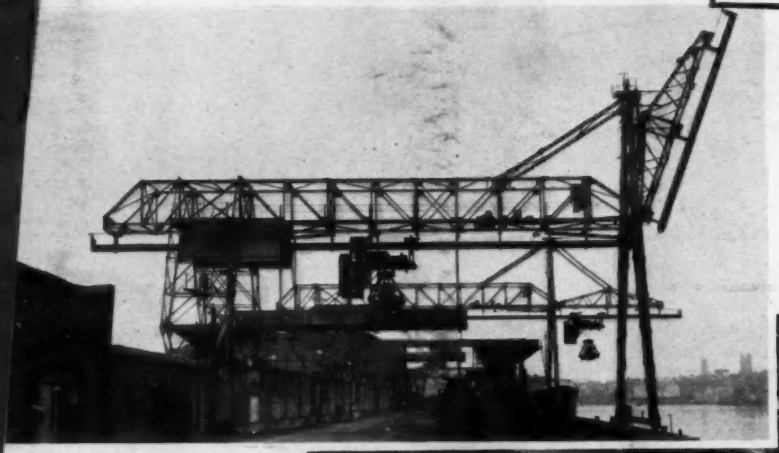
DETROIT



TRANSPORTERS—

for unloading coal ships and/or serving coal and coke stores.

SPECIAL EQUIPMENT

—such as the underslung Travelling Jib Crane shown working in a covered coal store.

STEELHOIST

ALSO WAGON TIPPLERS OF ALL TYPES - SKIP HOISTS - TELPHERS - CONVEYORS, ETC.

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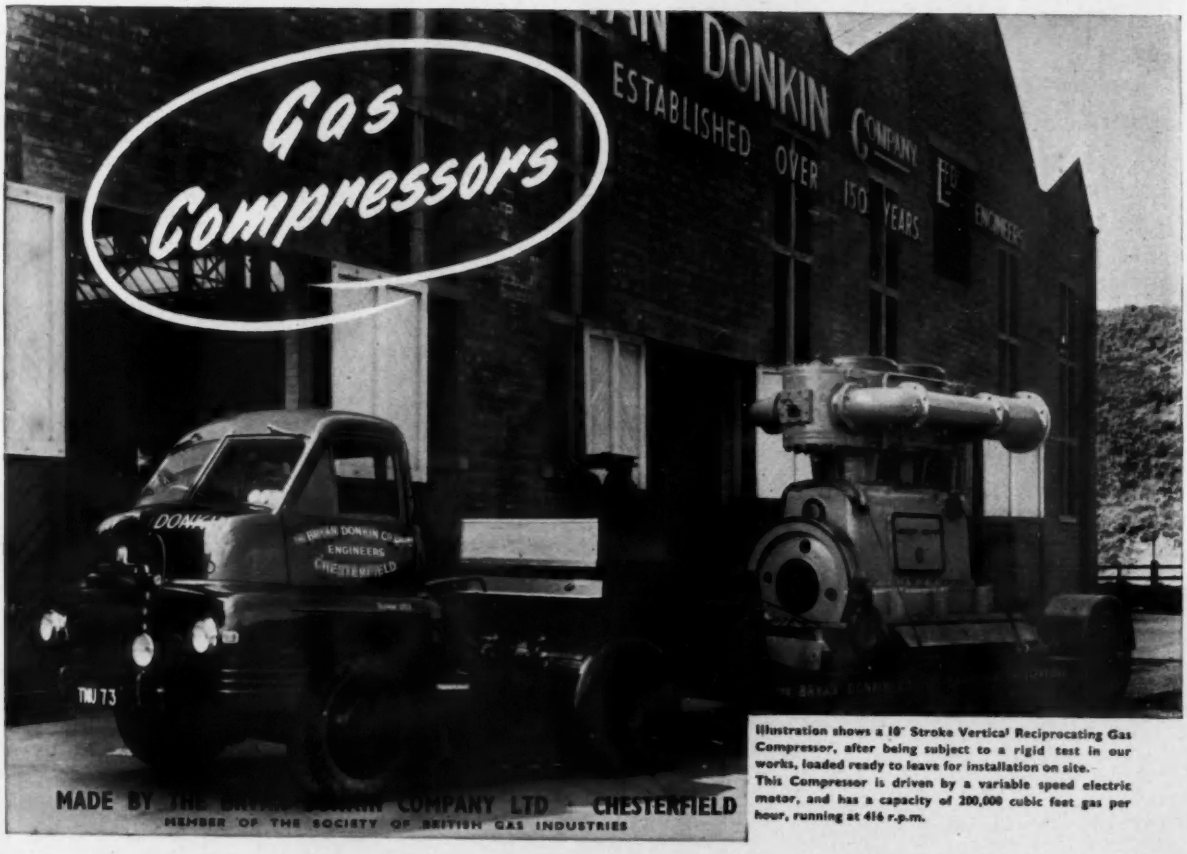
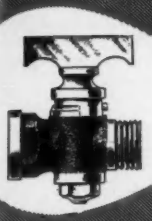

Gas Compressors
ESTABLISHED OVER 150 YEARS
ENGINEERS
TWU 73
MADE BY THE BRYAN DONKIN COMPANY LTD - CHESTERFIELD
MEMBER OF THE SOCIETY OF BRITISH GAS INDUSTRIES

Illustration shows a 18" Stroke Vertical Reciprocating Gas Compressor, after being subject to a rigid test in our works, loaded ready to leave for installation on site. This Compressor is driven by a variable speed electric motor, and has a capacity of 200,000 cubic feet gas per hour, running at 416 r.p.m.

A STORY OF DEVELOPMENT

THE EVOLUTION OF THE Spersom MAIN COCK



1901

At the Coronation of King Edward VII the "Spersom" Main Cock was 24 years old.

1911

Now ten years older the design is practically the same except for the contour of the Thumb Plug Fan.

1937

Great advancement has been made and the "Spersom" Main Cock has now self-lubrication and self-adjustment for wear.

1953

The new "Spersom" Main Cock has lubrication reservoirs and self-adjustment for life long service without attention.

Spersom TRADE MARK

SPERRYN & COMPANY LIMITED,
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PREPAYMENT METERS

Dependable Year-in Year-out

Product of Radiation Ltd

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GAS METERS

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A

Evershed C & S Type Gas Stock Transmitter installed on No. 2 Relief Holder (C.W.G.), Beckton Gas Works, North Thames Gas Board, to give indication in the C.W.G. Plant of the stock in the holder. This is only one of the Evershed systems of gas stock indication which have been adopted by gas undertakings. Evershed pressure indicators are also used in the wider distribution network from this main producing plant.

An Evershed Gas Pressure Transmitter adjoining th district Governor installed by the Eastern Gas Boar (Tottenham Division) at Waterfall Road, Southgate, i connection with the high-pressure distribution system fro Willoughby Lane Gas Works five miles away. The trans mitter has a range of 0-40 in. W.G., with an optimu working pressure of 11 in. S.G.

In the Booster House at Tottenham are 12 Evershed indi cators and recorders each showing the pressure at distant ga governors at various points in the distribution network economic control of the booster plant is thus facilitated

Economy in Gas Works Plant Operation

EVERSHED INSTRUMENTATION CENTRALISES INFORMATION AND CONTROL

The many systems of Evershed instrumentation, each one designed to meet a specific need, contribute to the economical planning and operation of modern gas undertakings by providing all the advantages of centralised information and control.

These include :

Remote Indication of gas holder volume.

Indication at the producing plant of pressur at local distribution governors in high an medium pressure mains.

Automatic operation of control valves an governors.

The faithful indication of the smallest varia tions in quantity facilitates economy in bot production and distribution. Booster pumps ca be run with the utmost economy in accordanc with the actual pressure at distant point

A full survey of the applications of Evershed Instrumentation to the gas industry is contained in Publication GJ23.

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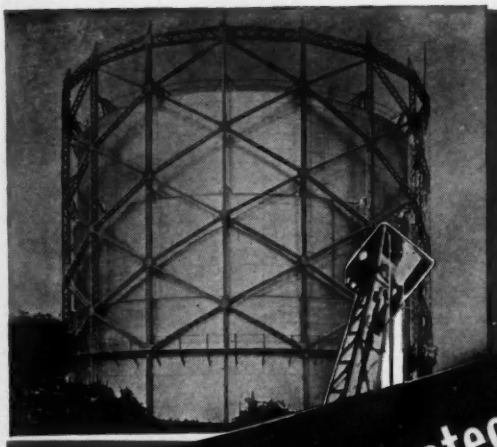

Gasholder in Kent showing brilliance of Atlas Ruskilla Aluminium Paint.

For the protection of metal structures

Spirit Containers, property of Socor Petroleum Co. in Portugal, coated with "Atlas Ruskilla" Aluminium Paint. High reflectivity of this paint reduces effects of solar heat and consequent loss of spirit by evaporation.

ATLAS RUSKILLA Iron and Steel Preservative Paints have been specifically designed for the enduring protection of all types of structural work. They embody over half-a-century of specialised experience in the manufacture of anti-corrosive paints, and their stamina has been proved in every part of the world. Let us send you Shade Card and prices.

For economy's sake, order or specify . . .

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IRON & STEEL PRESERVATIVE PAINTS

The Paints of Stamina!

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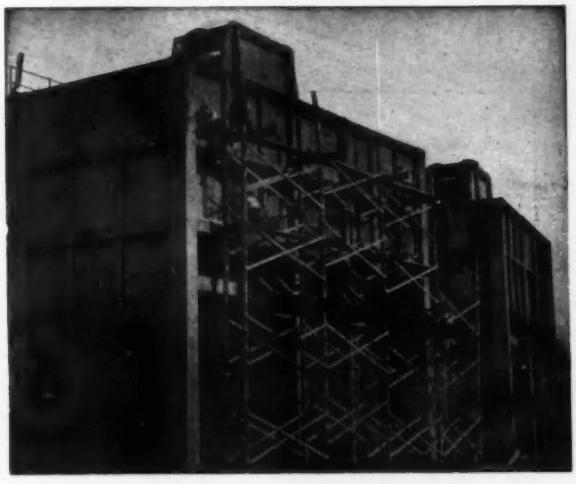
TAS/AS 76

Gunite



One of the reinforced concrete structures reconditioned with Gunite for the City of Carlisle Gas Undertaking.

Gunite—concrete applied by air pressure—has numerous applications where its great density and extreme adhesion have exceptional value.

For repairing reinforced concrete it has particular merit, as, due to the method of application, a uniform density and adherence is obtained whenever Gunite is applied.

For lining coal bunkers and steel chimneys it possesses great resistance to corrosion and protects steel-work from the abrasive action of coal or coke.

Handbook "GUNITE" sent on request

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100, VICTORIA STREET, S.W.1

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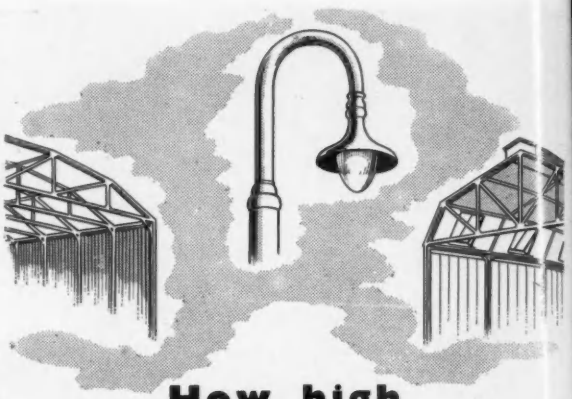
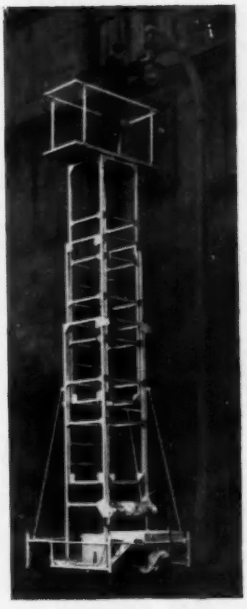


How high are your STANDARDS?



STANDARDS of efficiency—of maintenance—of cleanliness—yes, we mean them all. Things out of reach are too often out of mind, until trouble starts. Yet it is only a matter of bringing the awkward fittings within reach in order to give them the attention they require. Gibson Tower ladders do just that, and have found favour with municipalities, Government departments, and firms throughout the country as the most effective way of stepping up to trouble.

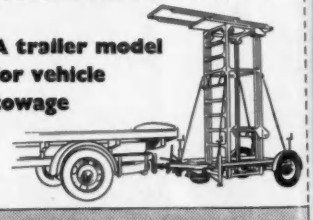
All Gibson Towers are made in aluminium alloy—light and strong. Hand winch operation speedily moves the telescopic frames, while pre-tested ropes and mechanical devices fully protect the operator. Electrically propelled, or hand-and-trailer models are available, and all towers have stabilising jacks, parking brakes, and all those etceteras which mark a well finished job.

Gibson Towers are ideal for all high-level maintenance work, outdoors or indoors. Users report that they recover the cost within eighteen months by reduced labour costs.

Please write for our descriptive leaflet.

. . . and it folds up too!

A trailer model for vehicle towage



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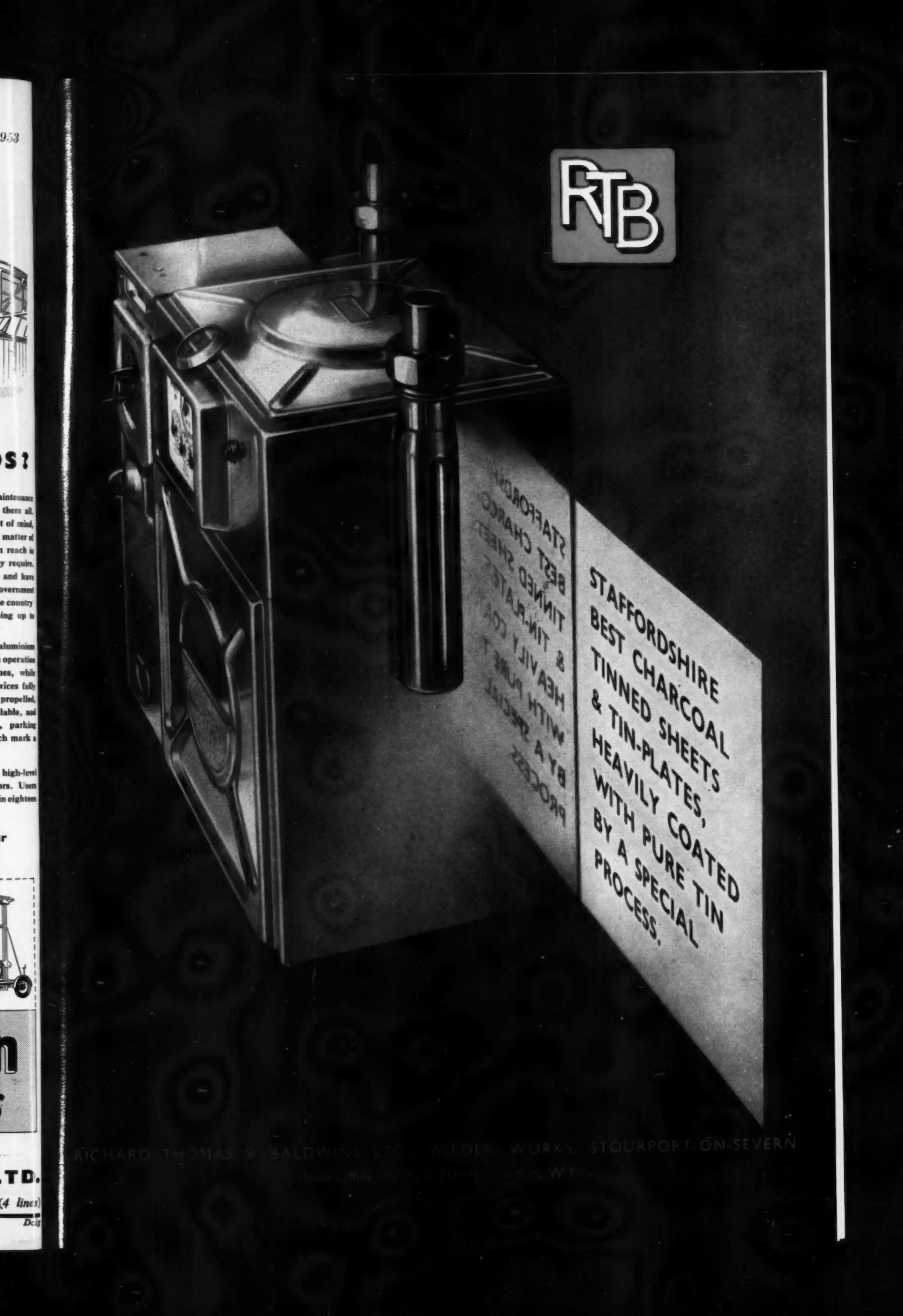
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WITH PURE TIN
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YOU CAN get higher output with lower fuel consumption . . .

. . . and a saving of capital cost into the bargain. . . .

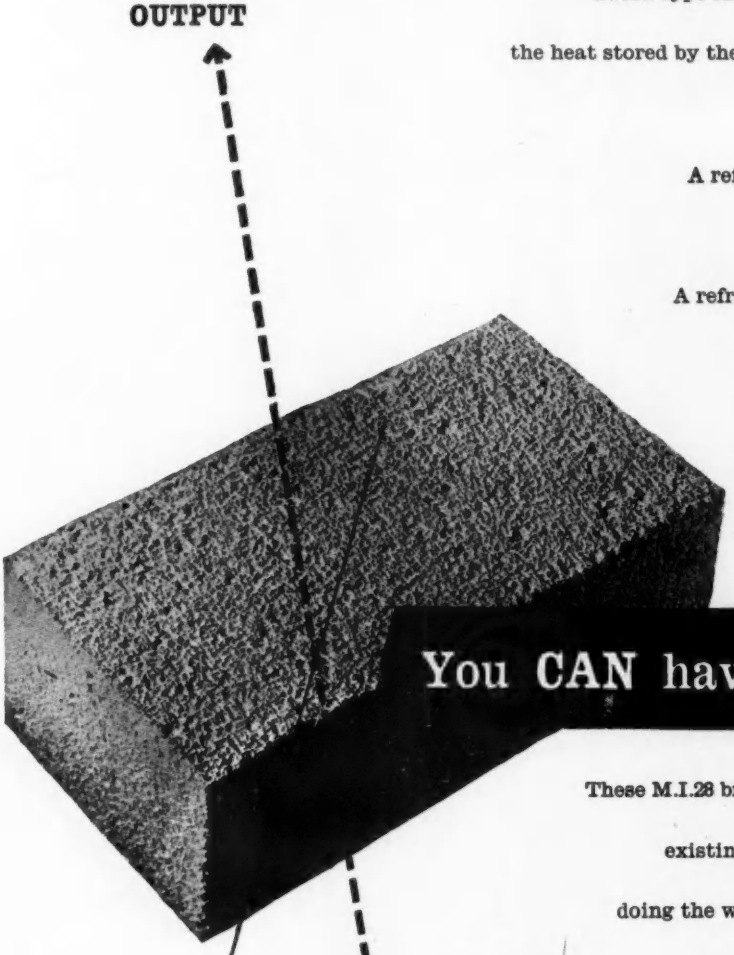
What are we talking about? . . . Furnaces.

Batch type furnaces in particular, where a reduction of the heat stored by the refractories speeds up the heating cycle

We are talking of the M.I.28 brick.

A refractory that stores only a fraction of the heat stored by an ordinary firebrick.

A refractory that will stand a face temperature of 2800°F. (1538°C). *A hot-face insulating refractory that is better made for harder service than any hot-face insulator made in this country before.*



You CAN have it BOTH ways

These M.I.28 bricks have shortened the heating cycle on existing furnaces so much that two furnaces are doing the work of three — and with little or no more fuel. A saving in capital and overheads that makes the extra cost of the bricks look silly . . .

MORGAN Refractories

ARE WORTH FAR MORE THAN THEY COST

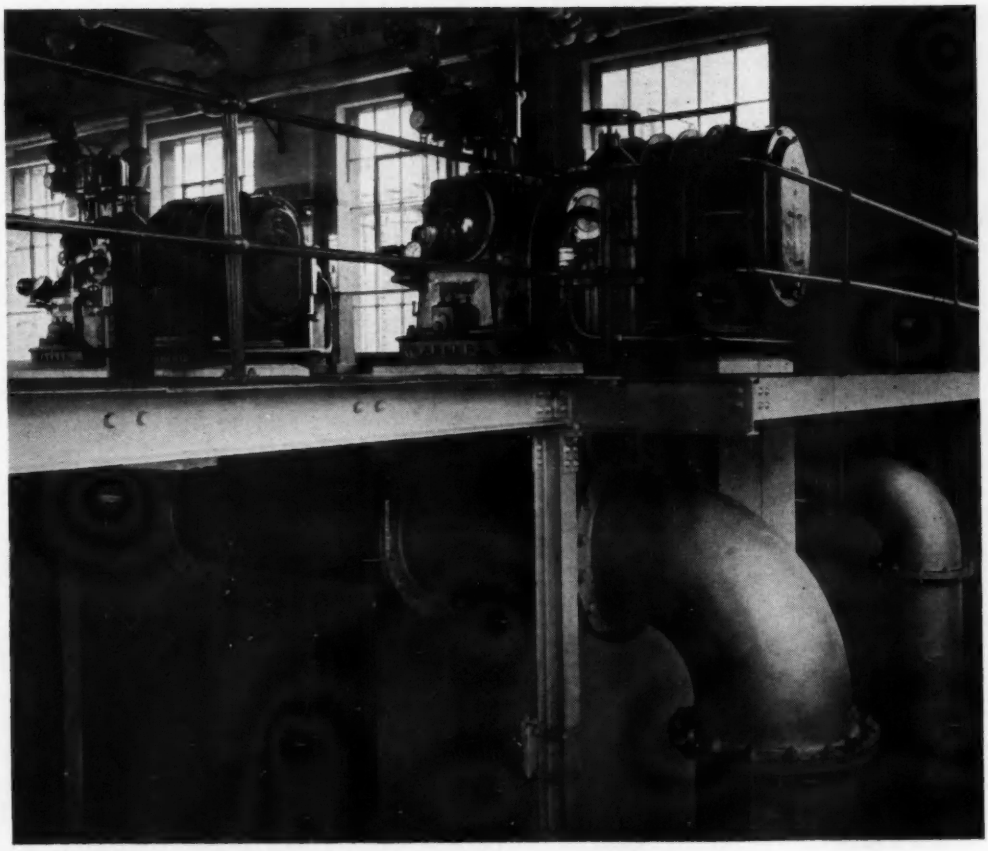
THE MORGAN CRUCIBLE COMPANY LTD.,
(Refractories Group), Neston, Wirral, Cheshire. Telephone : Neston 1406. N.E.38

SIMPLICITY

The photograph below
illustrates clearly how simply the inlet and outlet
connections and foundations can be arranged when

WALLER EXHAUSTERS AND **BOOSTERS**

are installed. If overhead connections are used it is equally simple.



Photograph by courtesy of Eastern Gas Board.

GEORGE **WALLER** & SON LTD.

PHOENIX IRON WORKS, STROUD, GLOS.

Members of the Society of British Gas Industries

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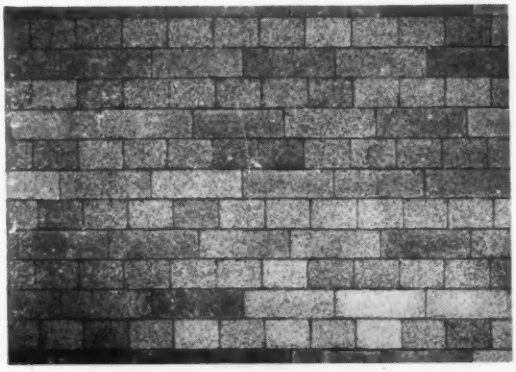
STEIN *Refractories*



THE STRENGTH OF FURNACE BRICKWORK—and durability of the furnace lining in service is greatly controlled by the joints. Well shaped bricks of accurate size, use of a Refractory Cement correctly chosen for the purpose, combined with good bricklaying (which means thin, tight joints) gets a furnace lining off to a good start. A Refractory Cement should be selected just as carefully as the brick with which it is to be used. We are always very willing to give our advice on the best type of Cement for particular applications.

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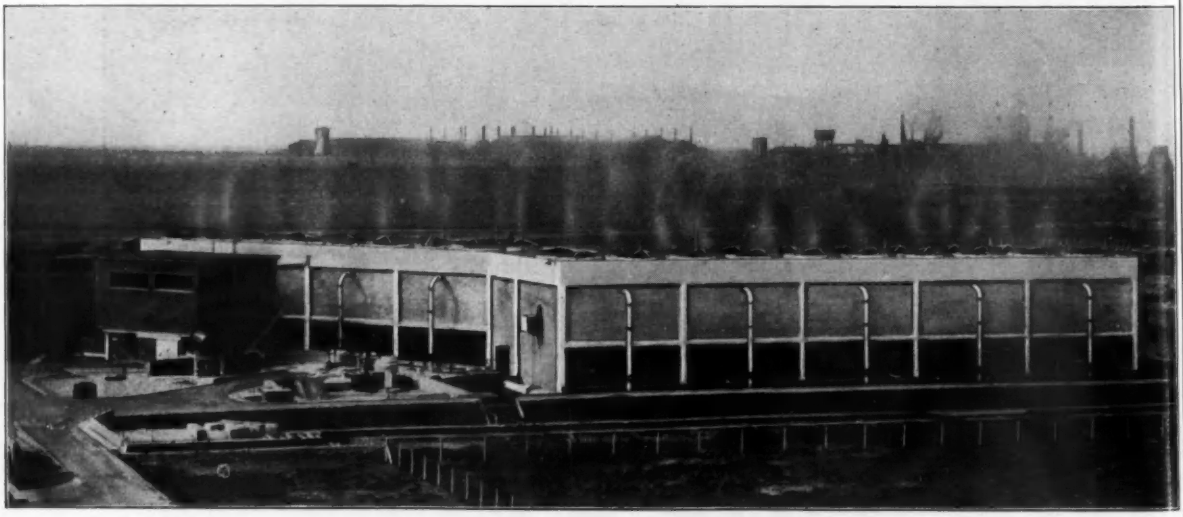


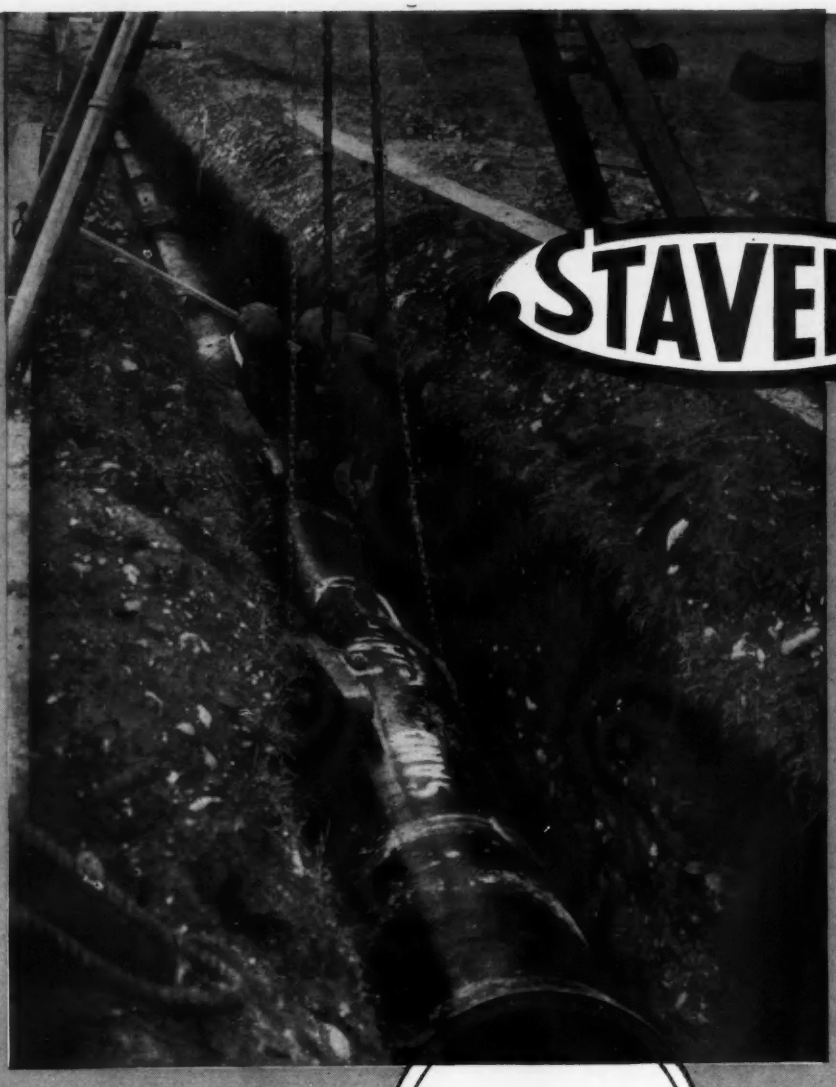
THE ABOVE ILLUSTRATION DEPICTS A WATER COOLING TOWER INSTALLATION OF THE MECHANICAL INDUCED DRAUGHT TYPE. TO ACHIEVE THE VERY EXACTING DUTY SPECIFIED A TOTAL OF 36 FANS ARE EMPLOYED WHICH ARE SITUATED IN THE ROOFS OF THE TOWERS. THE INTERNAL FILLING IS EXCEPTIONALLY COMPACT, CONTAINS THE LATEST IMPROVEMENTS AND IS SO DESIGNED TO MINIMISE OPERATIONAL COSTS. IN THE BACKGROUND TOWARDS THE LEFT CAN BE SEEN A 160 FEET HIGH NATURAL DRAUGHT HYPERBOLIC TOWER FOR A SERVICE REQUIRING A LESS STRINGENT PERFORMANCE.

THESE UNITS ARE ALL PRODUCTS OF

THE DAVENPORT ENGINEERING Co. LIMITED BRADFORD

WHOSE SPECIALITY IS THE DESIGN AND CONSTRUCTION OF

WATER COOLING PLANTS



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FOR GAS & WATER MAINS

In extensions to gas works installations and the development of new projects, cast iron mains are of primary importance.

Staveley pipes can be relied upon to give an efficient layout—as they have done for many years past.

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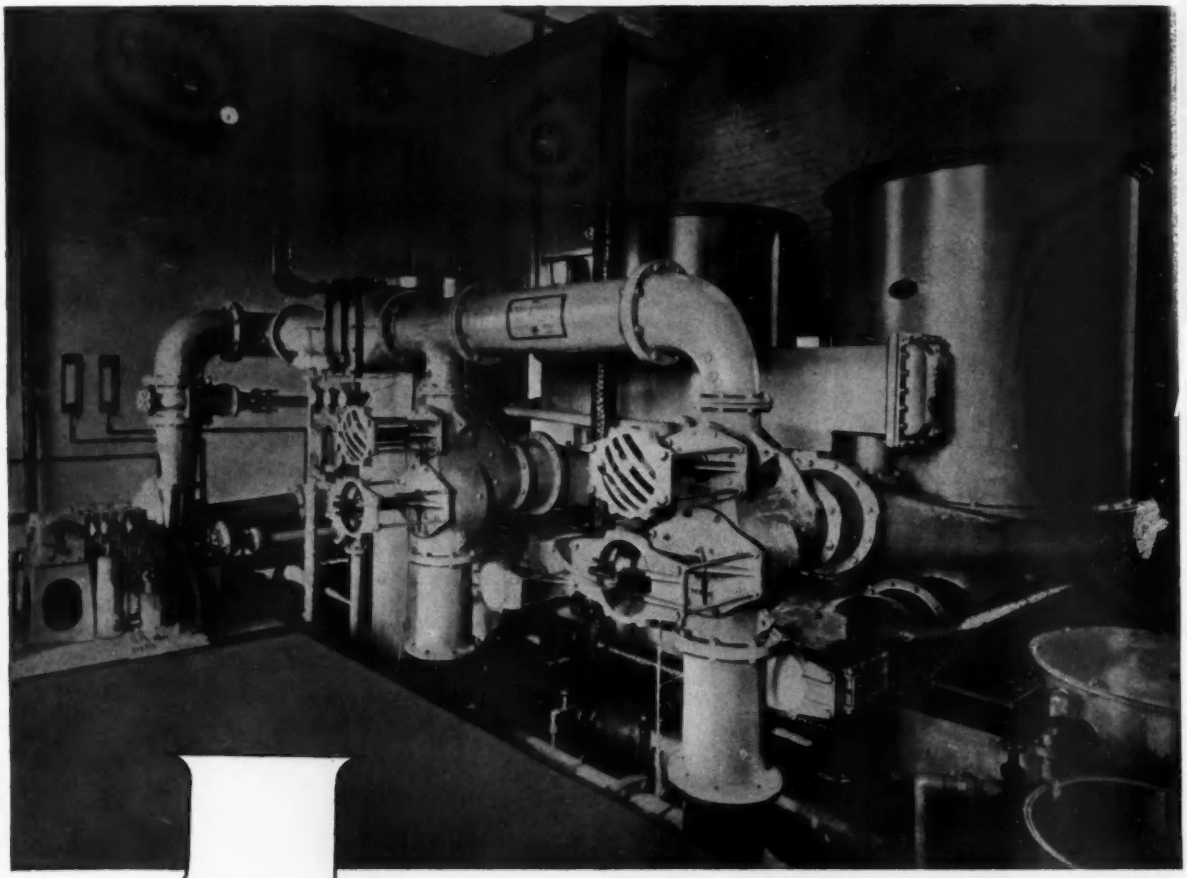

100% recovery of Benzole

HAS BEEN RECORDED

100% recovery of Benzole has been recorded in the Gas Industry where Sutcliffe Speakman plants of the type illustrated are already installed.

These recovery plants are the result of over twenty years' experience in the manufacture and industrial use of Active Carbon. Their capacities range from 250,000 cu. ft. per day. Entirely automatic and with few moving parts, they are compact, clean in operation, and economical to run. Their initial cost, too, compares favourably with that of other recovery systems. In every way they are the most profitable investments. We are always ready to draw up a complete balance sheet for Benzole recovery in any specific undertaking of the Gas Industry.

to cut Benzole wastage to a minimum, consult

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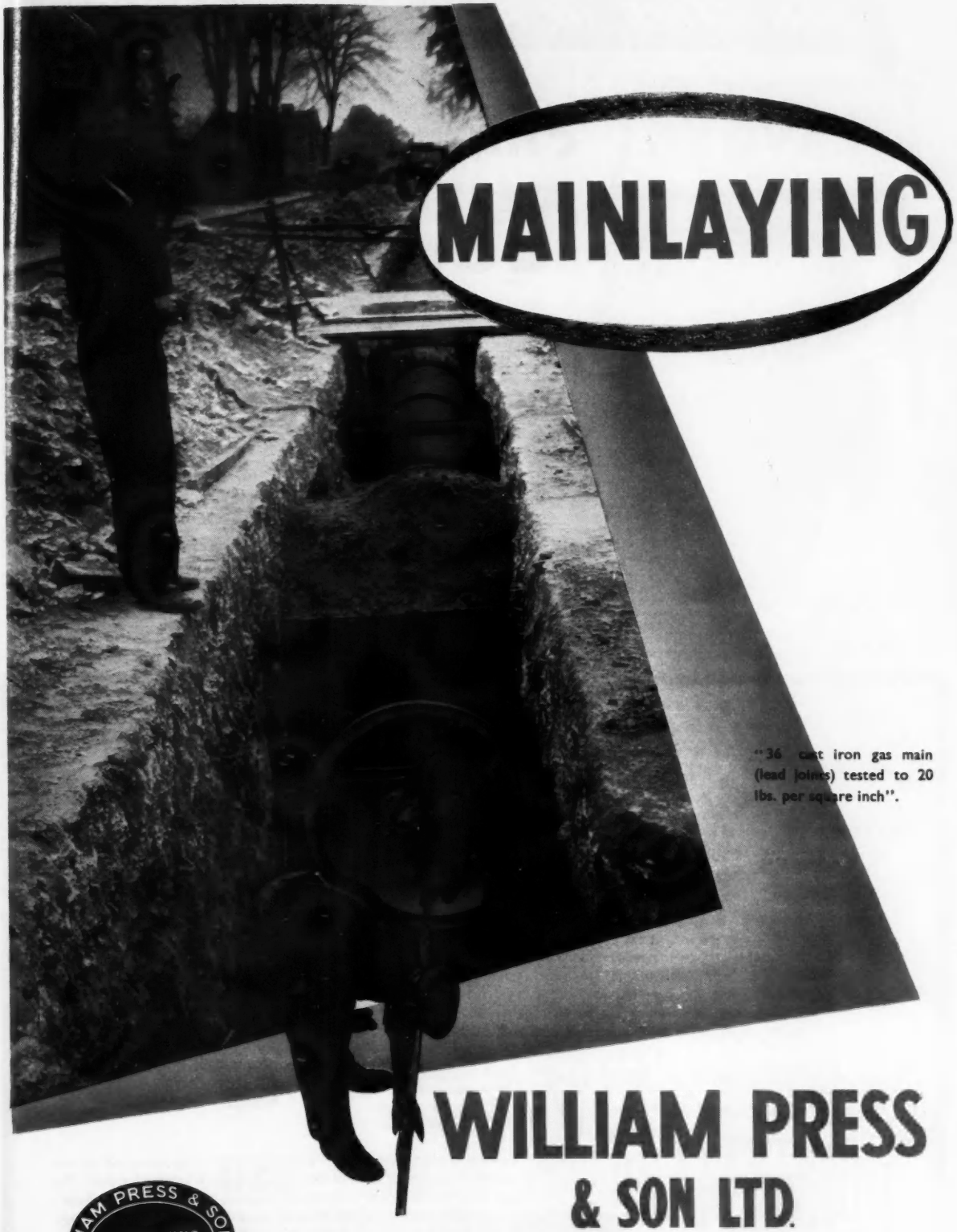

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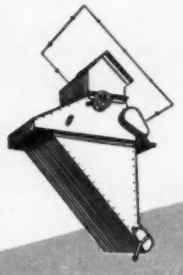
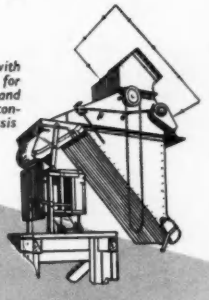
All units can be applied to EXISTING BUNKERS

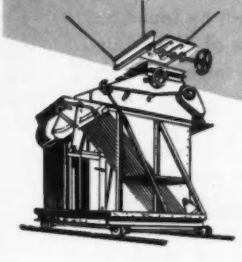
All units can be fitted with dual SACK HOIST for low coke hoppers.



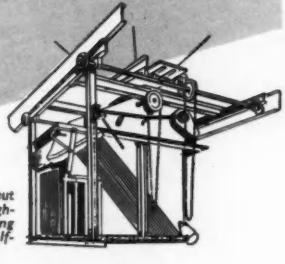
Standard unit arranged for continuous running, as used for truck or lorry loading.

Standard unit fitted with clutch and hand control for de-breezing, weighing and bagging coke as a self-contained unit on one chassis





Standard unit but incorporating weighing and bagging equipment as a self-contained unit on one chassis.



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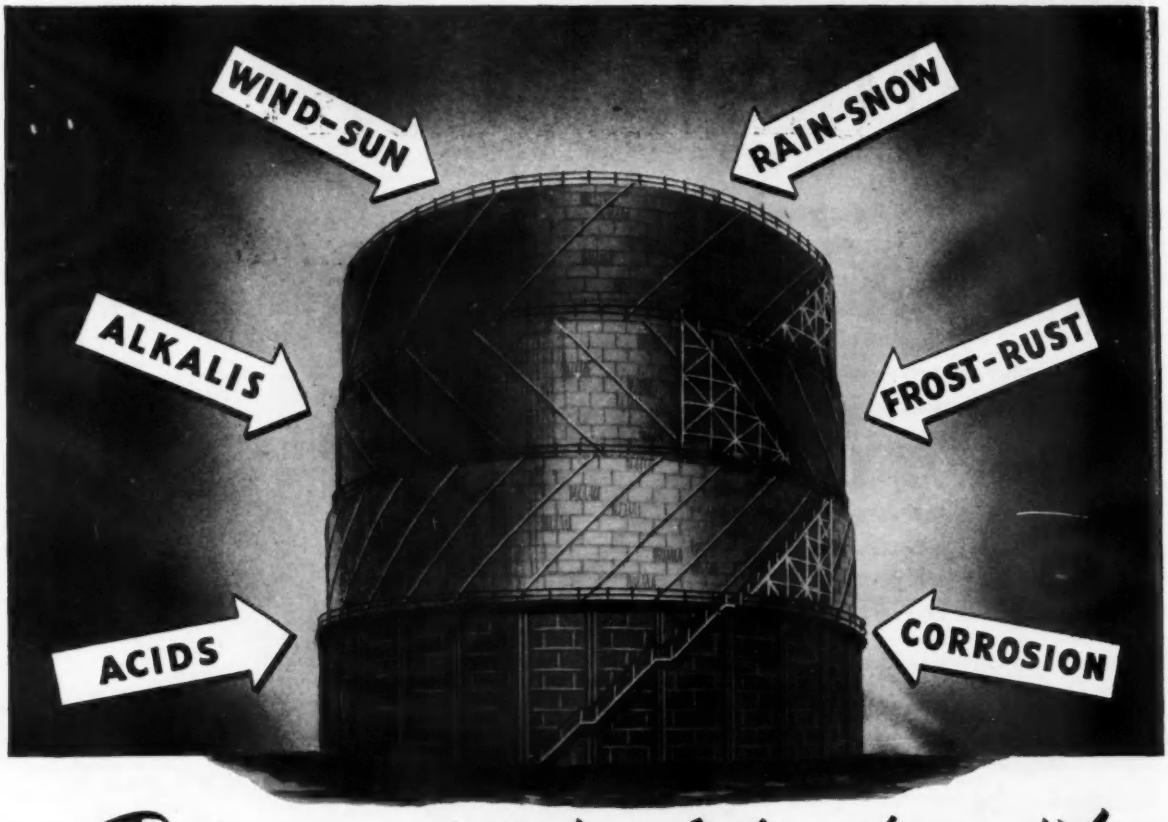

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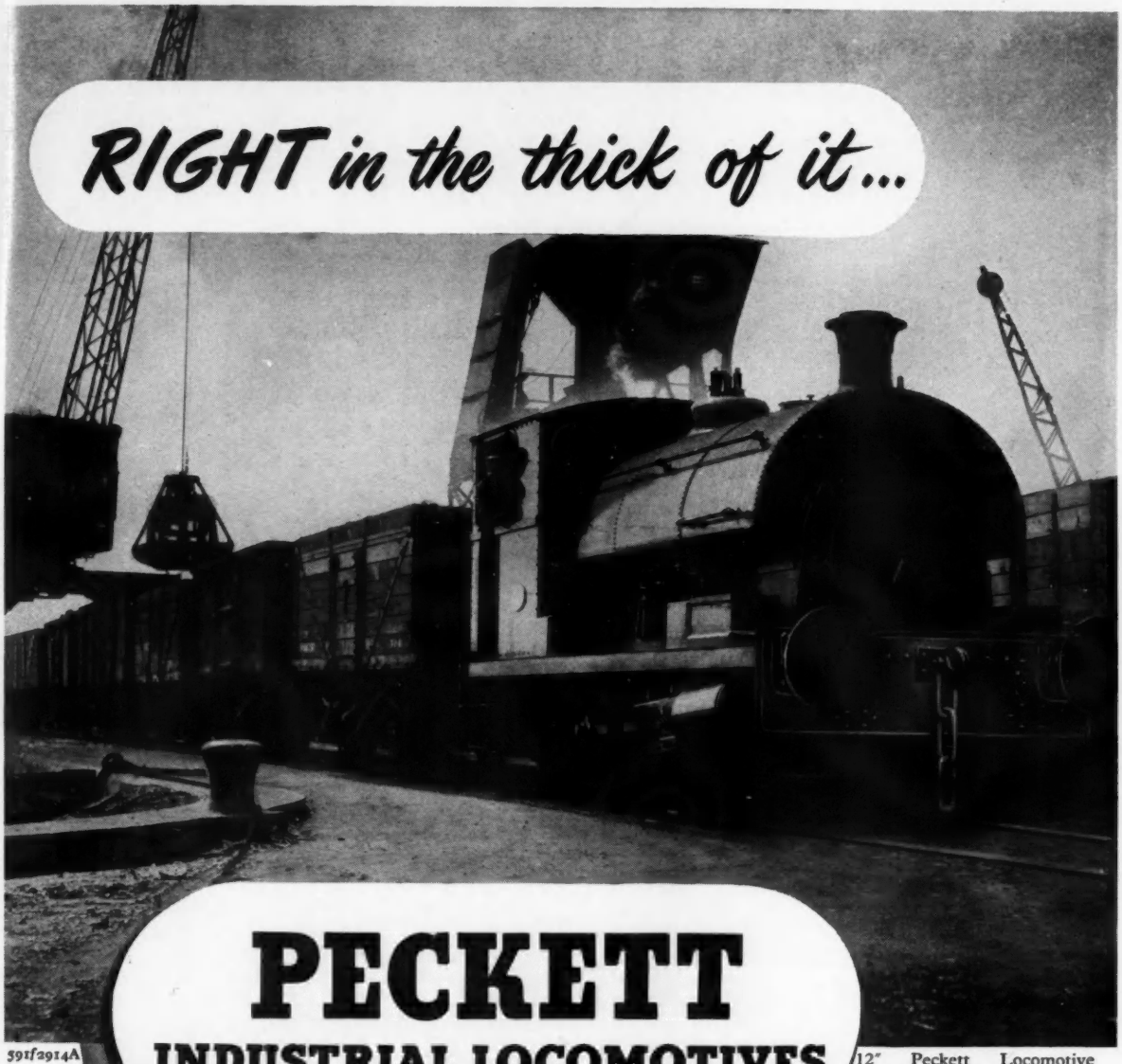

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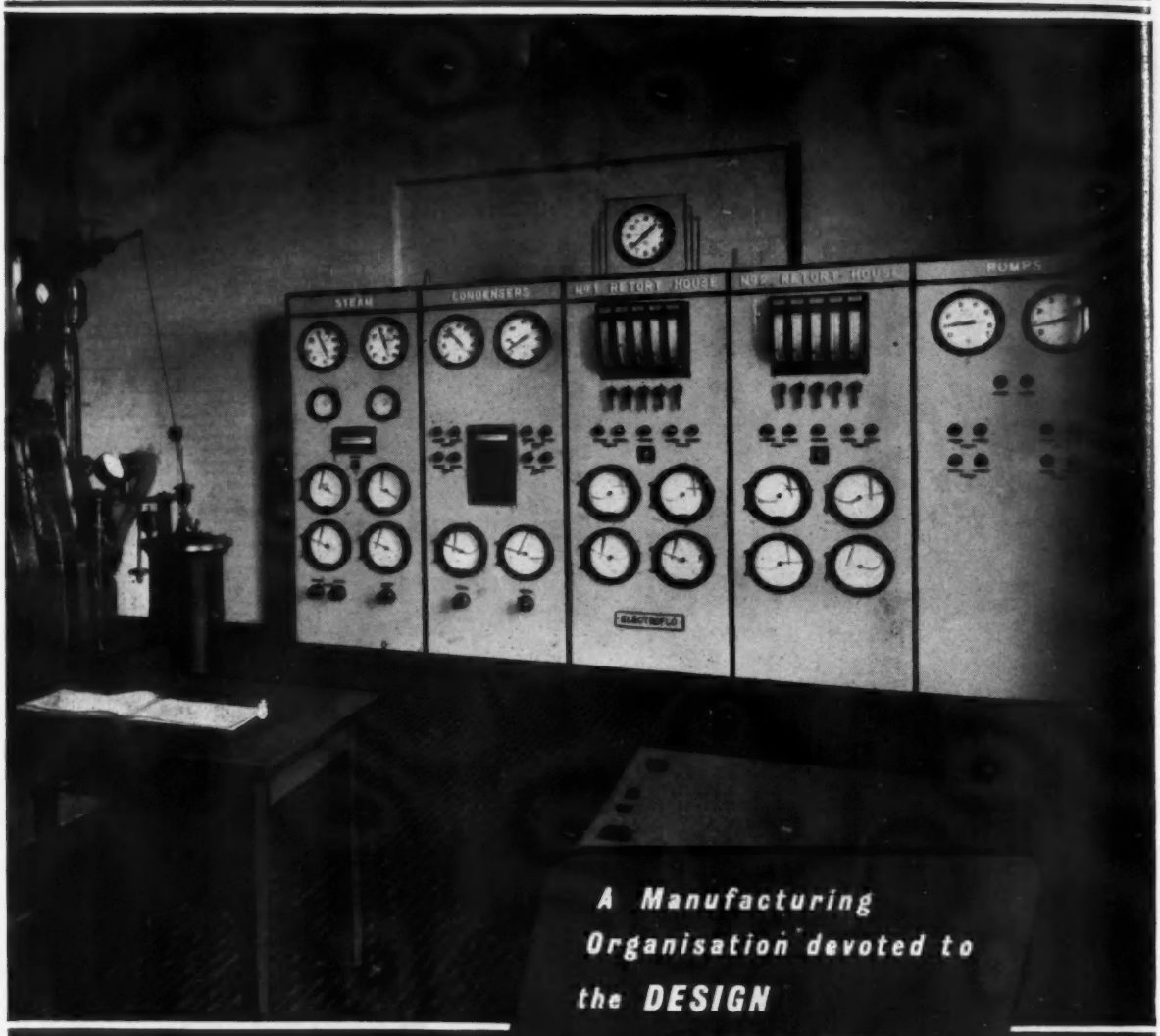

Exhauster House Instrument Panel supplied to the Garston Works of the Liverpool Gas Undertaking

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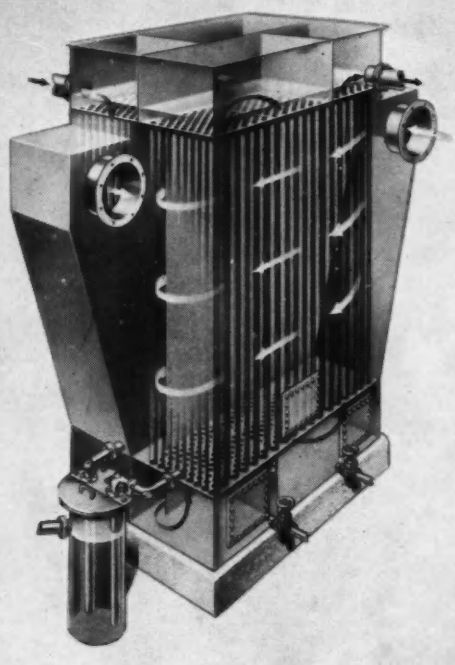

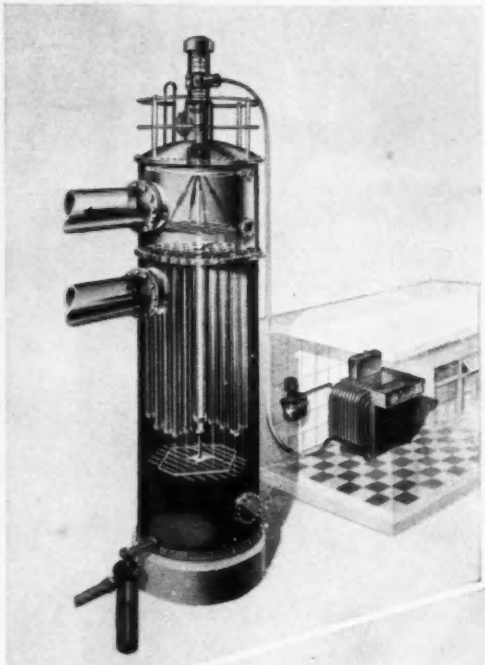

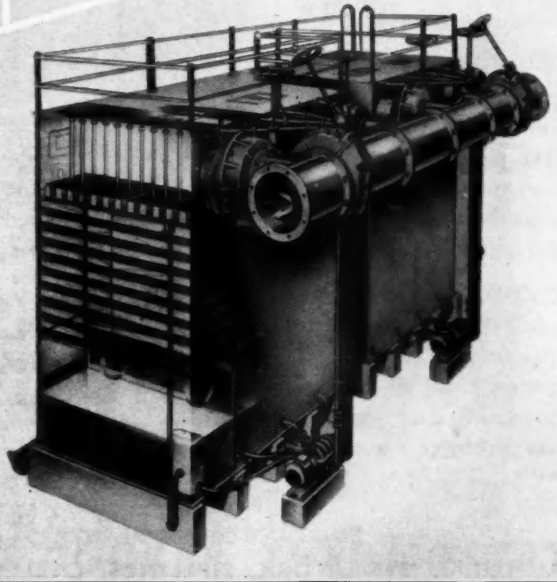

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W22a

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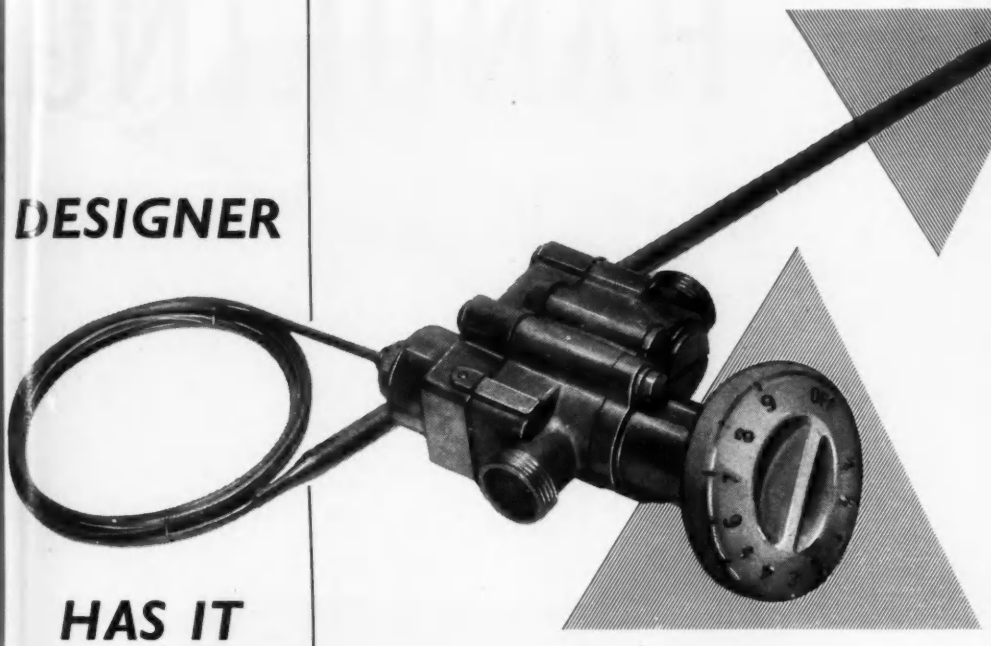

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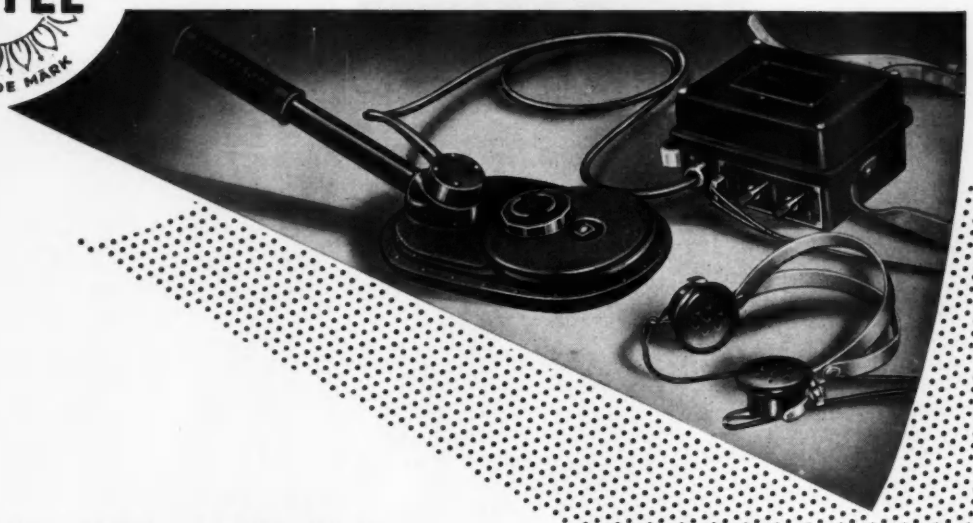

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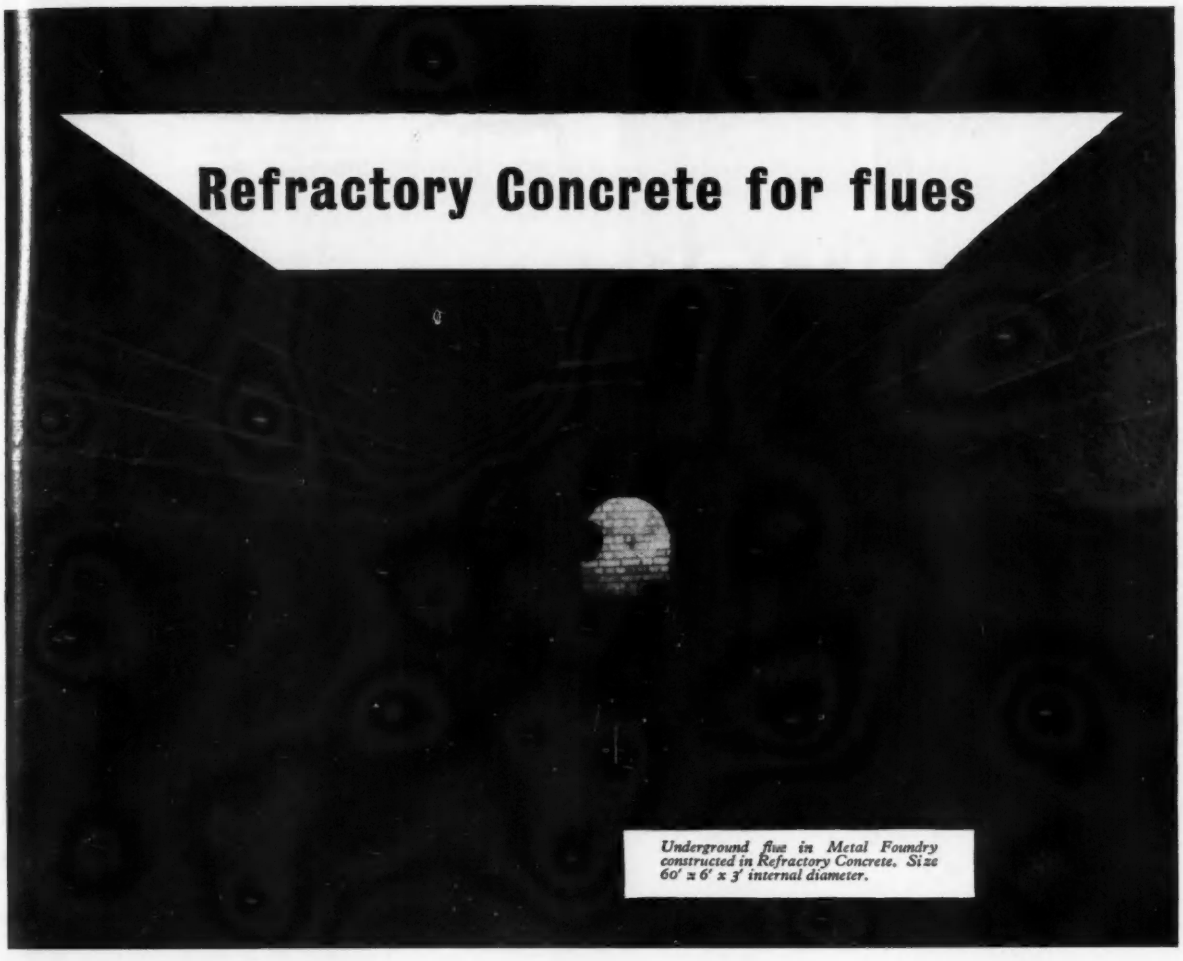

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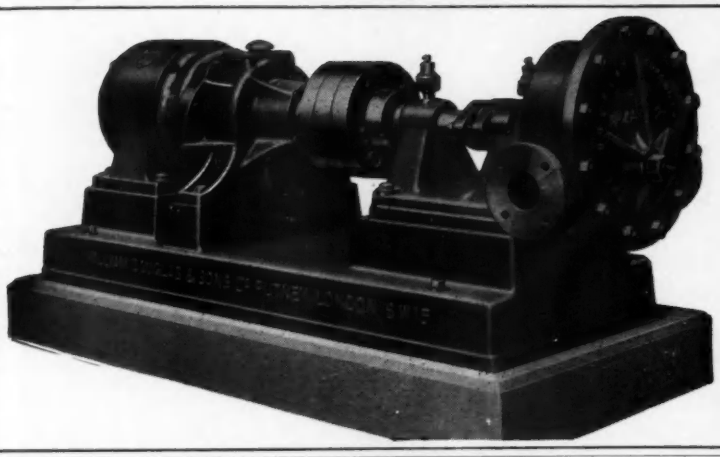

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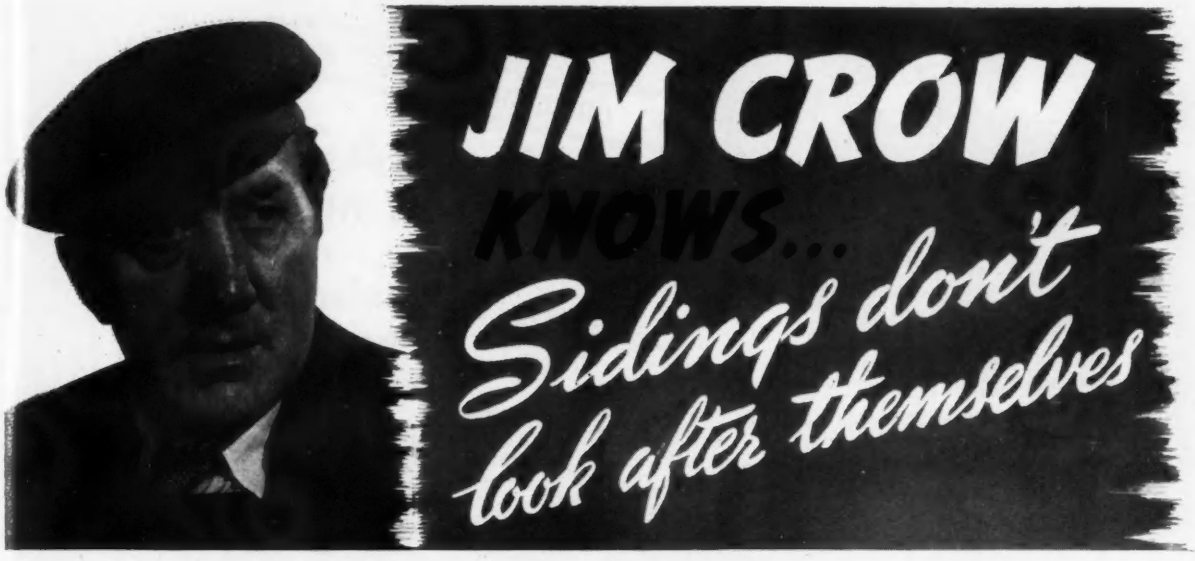

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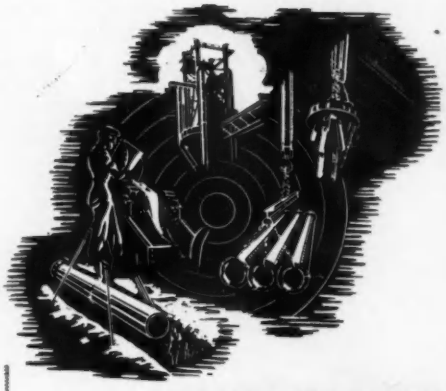

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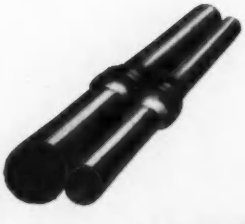

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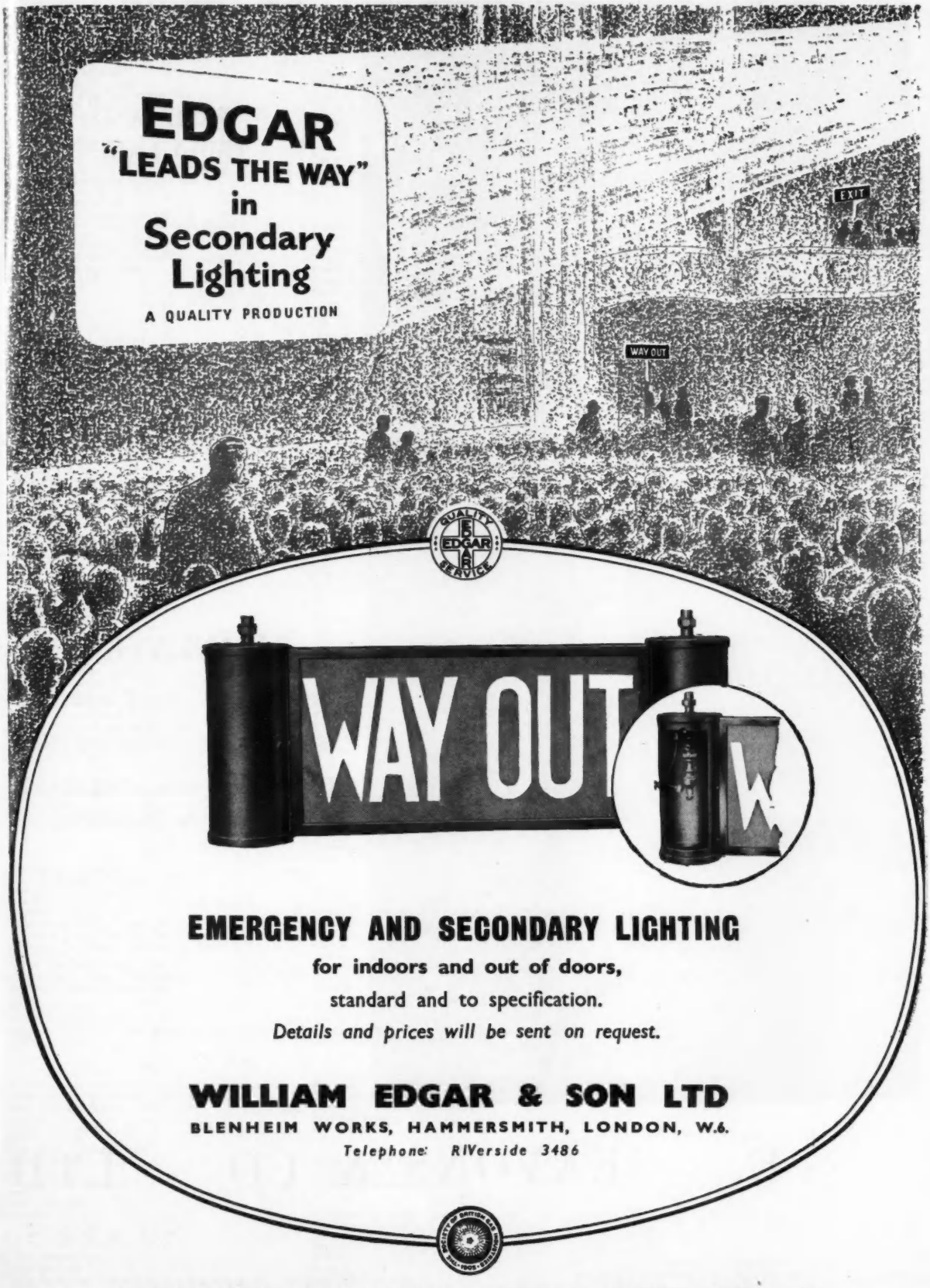

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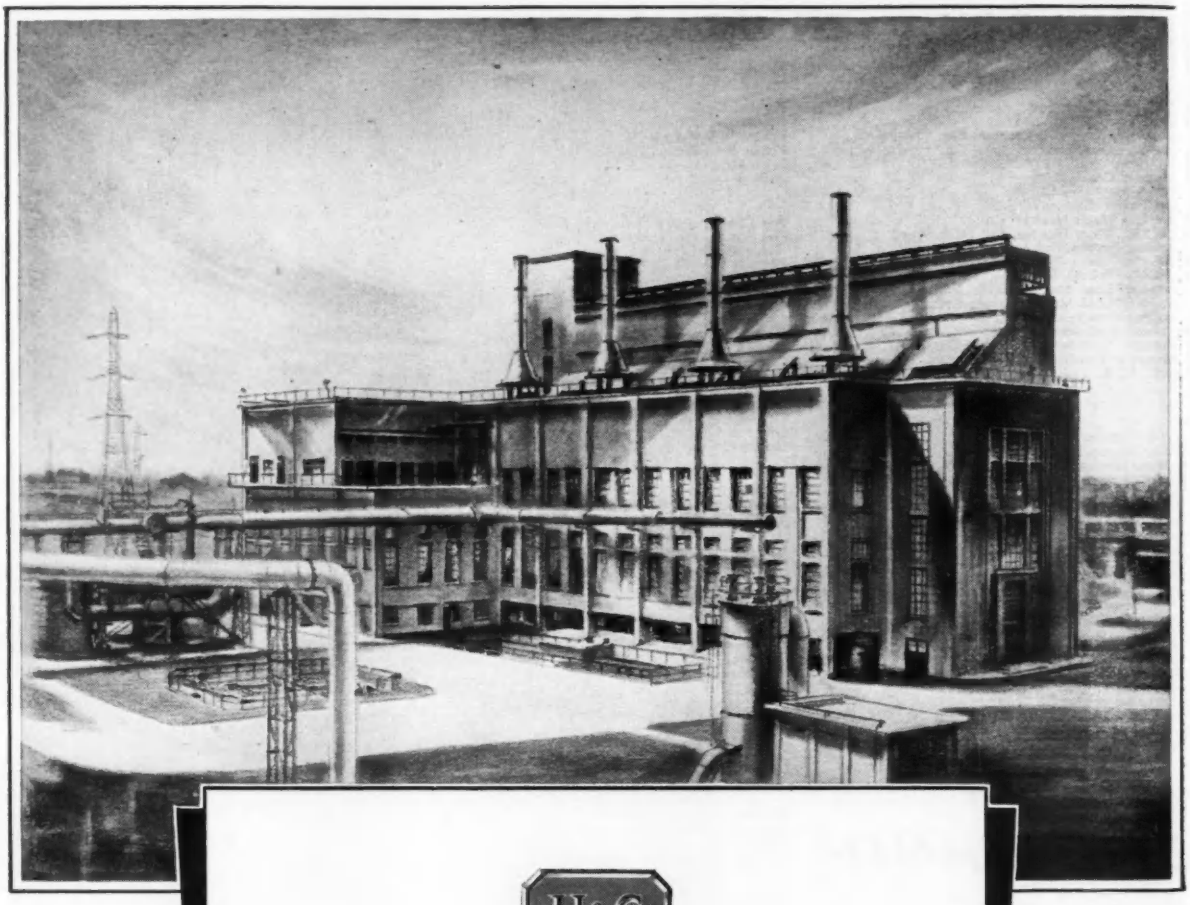

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Gas Journal

105th YEAR OF PUBLICATION

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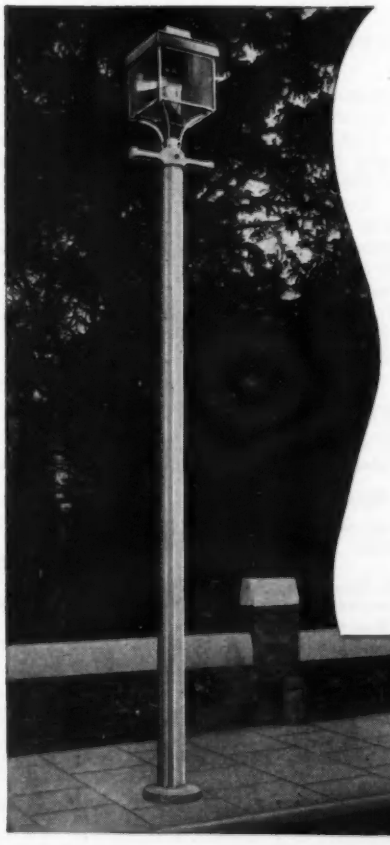

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GAS JOURNAL

VOL. 275. No. 4706 105TH YEAR August 12, 1953

ARE GAS SALES OUT OF HAND?

We have always maintained that selling is something some people can do and nobody can write about. Like most generalisations that is not strictly true, and it is on the assumption that there must be an exception to the rule that the following observations are made. We feel that at the present time, when sales are vitally important to our industry, there may be some virtue in examining with a dispassionate eye the fundamentals of our selling machinery. Normally we try to avoid the hackneyed analogy, but if readers will bear with us briefly we would like to consider the commercial side of a gas board as a hand. The movements of the hand are controlled by the brain, which distant eminence we will think of as the Gas Council. Once the essential message has been transmitted from the brain to the muscular centre of the hand there is a delegation of responsibility. The fingers, representing the sales officers of the board, are capable of performing certain operations. When their efforts are augmented by the thumb, representing publicity, their scope is vastly increased. In the perfectly healthy system this machinery would be capable of performing a variety of useful jobs. Sometimes, however, something goes wrong. If insufficient direction is obtained, the hand becomes inert, or clumsy, or may assume some uncontrolled nervous scrabbling of its own. Perhaps the direction is clear and it is the hand itself which is at fault. It may be due to injury—even a finger missing—to paralysis, or rheumatism. In fact, failure can occur at any point between the original desire and its accomplishment.

What then of our gas board hand? Is it grasping the opportunities which present themselves? Is it hitting its competitors—above the belt, of course—with all its muscular power? Is it pushing home to the people in its area the fact that gas is something they cannot afford to be without? Frankly, no. We suggest that the reason stems not only from the brain, but from the hand muscles, the fingers and thumb—in fact it stems from them all.

Let us start with the brain, hiding away behind its bone curtain. It is for the Gas Council to decide what the industry shall sell, or indeed whether it shall sell at all. It cannot sell something it has not got, so the first requirement is a surplus of gas—clean gas. To get it the industry requires plant, and that means money and steel. It can get both from the Ministry but, very properly, it has to convince the Ministry of its need—the sort of operation at which the electricity industry is singularly adept. The relative increase in gas manufacturing capacity during the past few years hardly suggests that we have the same facility. On the contrary there is evidence of an attempt to keep sales *down* to meet supply, particularly with certain loads. Presumably we want the industrial, commercial, and domestic cooking loads. But what about street lighting? Should we allow it to perish in its own time without lifting a finger, or plan a sort of delayed rearguard action, permitting its gradual demise over a carefully controlled period? And space heating—do we want the load, other than for coke? Or water heating, perhaps the worst sufferer of all? To us, and to many others inside and outside the industry, it would appear that our planners have no plan; that they hover in a state of horrid indecision, seemingly unable either to get more gas and then sell it, or to admit that gas supplies are limited and therefore certain loads are a source of embarrassment. Or possibly the brain has a plan, but policy dictates that it shall be transmitted in small doses only, and in code, to the executives. Unless an ambitious policy is devised soon, electricity will romp home with the business; and we shall find that past glories have a habit of fading unless the tradition is kept alive.

So much for the brain which, by the way, controls not one hand but twelve. The old saying about not letting your left hand know what your right hand is doing becomes a frightening thing when no less than twelve hands, ignoring the summons of the brain, exhibit symptoms of individuality. Do the area boards agree a *national* policy for selling, synchronising their campaigns, and utilising really co-ordinated publicity support? Apparently not. An interesting article in the August issue of *Gas Service* reveals an extraordinary diversity of thought on the subject, with the various area boards each going their own sweet way; only the North Thames and South Eastern Boards seem to be working in harness. On the subject of publicity, however, fairness prompts us to mention that this, the thumb of our analogous hand, has been heavily bandaged under the recent ban, during which difficult time it certainly made the best of a bad job. Now, with the fetters removed, there is a need for a concerted drive on a prearranged national theme. It appears that some apprehension exists lest the Minister,

spurred on by a public outcry against promotional expenditure by a nationalised industry, should be forced to reimpose the ban. While discretion may indeed be the better part of valour, it is also true that faint heart never won fair lady—and it seems unlikely that the housewife will want for attention in the months to come.

Lastly, the fingers, the salesmen of our gas board hand. There has been criticism lately—in which we have joined—of their lack of ability, and it is true that much of the pre-war nimbleness and flexibility has gone. But the fingers are like those of a pianist who has not played for ten years. When he wishes to resume his work the fingers will not obey without practice. Let us not be too hard on the salesman. When his management makes up its mind what it wants, when it provides him with the right appliances at the right price, and with tariffs and easy terms, that have real competitive appeal—*then* will be the time to see if he is found wanting.

If we have laboured this hand business overmuch, we apologise. It was merely a device to show the chain of responsibility and the way in which only complete co-ordination of movement can achieve the objective. There are signs that electricity is clenching its fists in preparation for an attempted knock-out. It would be a pity, wouldn't it, if our tiny hand was frozen—stiff?

THINGS SEEN DARKLY

It does not necessarily follow, as Mr. D. B. Stokes remarks towards the end of his paper to the Manchester Juniors on 'Retort House Practice' (see later pages of this issue), that because a man can effectively rod a retort he will be able to supervise the work of his fellow-beings. Nor does it follow that because a man can effectively direct the operations of a retort house he can effectively communicate to his fellow-beings just what he has been doing. The very first sentence of this paper seems to be a masterpiece of obscurity. 'The author hopes to show,' he remarks, 'that old foundations offer many avenues for investigation, the old foundation in this case supporting an equally venerable retort house.' But surely he does not propose to say anything at all about the foundations which support the house. Yet he might very well have done so because a study of the foundations which were necessary at Blackburn shows that their nature gave rise to some of the difficulties of which Mr. Stokes complains. The nature of the subsoil was such that very long piles had to be driven to sustain the load. It is understandable, then, particularly in the light of the limited experience of 1920, that the planners and designers of those days adopted the skip and crane combination for the transport of coke from the retorts. The combination had some advantages but its use has long since been abandoned.

Vertical retort installations put into commission immediately after 1918 were necessarily constructed to designs which showed little development from those of 1914. Steaming had been practised during the war period but its implications were not fully realised until about 1920 when the reports of the Gas Investigation Committee and of the Fuel Research Board became available. These implications had an immediate effect on design and by 1922 every type of continuous vertical retort was being built to designs definitely arranged to ensure effective and efficient steaming. Thereafter practically all previously existing retort benches were progressively reconstructed to embody the new ideas—with the result that thermal output per retort was generally increased by 50%, making gas at the same calorific value as before the reconstruction. The significant alteration was the lengthening of the retort by the addition of a section in which the heat of the coke after carbonisation was transferred to the incoming steam, much more effectively than it could have been transferred to secondary air circulating outside the retort, though the two could be and later were in fact combined.

Another obscure statement, unfortunately of wider currency, is that 'gaseous thermal yield is not in itself a measure of works thermal efficiency.' Of course it is not. Gaseous thermal yield is only one of the factors which are involved in the dimensionless expression 'thermal efficiency,' expressing the ratio between the thermal output and the thermal input of the system. There are other factors of equal importance. At the same time few will dispute that a satisfactory make of gas per ton of coal is a necessary feature of overall works efficiency and fewer still will dispute Mr. Stokes' own dictum that it is desirable to achieve the maximum volumetric as well as thermal output per unit of plant, though the two are by no means independent.

The fact is that the original attempt to make a 425 B.Th.U. gas from Lancs./Yorks. coal in these short retorts was a failure. It is now recognised that this low value is very near the bottom limit even in the modern retort. The best results to-day with these coals are being obtained at a calorific value of 450 B.Th.U., at which value the thermal output per unit of plant as well as the thermal efficiency of the process should be at something like their optimum values. There are enough data extant to show that if they are not there is something wrong either with the design of the plant or its operation.

SYMPATHY RATHER THAN INTEREST

Mr. Stokes' experiences with the settings at Blackburn will excite sympathy rather than immediate interest because most of the defects from which he suffered have been removed in all present-day designs of continuous verticals. Retorts are equally heated, such devices as the graduated nostril plug or its equivalent have secured an exact control of heat distribution with the minimum of adjustment, and fuel consumption in producers has been substantially reduced. Improved designs of gas offtake have eliminated troubles with gas exit. High average temperatures in the setting are secured without high spot temperatures. The introduction of high silica content refractories, however, has so far proved a mixed blessing. True, these refractories will stand up to higher temperatures, but they appear to lack the flexibility of the siliceous material of modern composition. The perfect retort refractory has not yet been attained in spite of the labour of research and investigation which has been put into it by manufacturers and their scientific advisers.

The dust problem has proved even more intractable. Admittedly, the water spray has removed the dust nuisance and with certain advantages, not all of them

altogether creditable to the industry. Coke at the temperature of the coke chamber absorbs moisture without becoming sodden more readily than after it is entirely cooled, securing an increased weight of 'coke' which looks well on the balance-sheet. But water spraying, though it may save steam, renders control of steaming difficult if not impossible—and controlled steaming is an important aid to thermal efficiency. Nor can it claim much economy since there should be plenty of low pressure steam available without solid-fuel fired boilers if waste heat recovery is effectively practised.

The successful application of airborne sealing to the maintenance of retorts is a point of interest. Here a few more words might have been advisable. It may not be realised at once that the method of control is to inject air impregnated with a refractory dust until the cracks and fissures in the retort are made up as indicated by the pressure, 6 to 8 in. W.G., maintained in the retort. The practice of airborne sealing before retorts are set to work and whenever they are open for scurfing or other reasons was found here to pay a handsome dividend, as indeed it does in most other types of retort and possibly ovens as well. On the whole, then, Mr. Stokes' paper must be regarded as the story of an heroic feat in grappling with the difficulties of one of the early installations of this particular type of retort, only partly reconstructed to modern designs.

A WISE MOVE

We heartily commend the action of the Council of the Australian Gas Institute in altering the constitution and rules to allow the Institute to admit to its ranks senior executives and technologists of firms engaged in the manufacture of plant, equipment, and appliances. If the expansion of our own Institution of Gas Engineers is any guide then the Australian Institute will have no occasion to regret the important step which it has taken to enlarge its scope and strengthen and widen its sphere of influence. The move was referred to by Mr. A. Spence, General Manager, Newcastle Gas and Coke Co., Ltd., N.S.W., in his presidential address to the Institute, extracts from which we publish on later pages of our issue today. It is a most interesting address, and it will quickly be gathered that its author is not exactly a supporter of nationalisation. To return, however, to the theme of this note, it is strange commentary that on more than one occasion the immediate Past President of the Institution of Gas Engineers, in addressing Junior Associations, has had to refer to the desirability that those Junior Associations which do not include in their membership duly qualified members of contracting firms should reconsider the ban.

AIR POLLUTION

The inclusion of two members of the Institution of Gas Engineers as members of the committee jointly appointed by the Minister of Housing and Local Government, the Secretary of State for Scotland, and the Minister of Fuel and Power, to investigate air pollution and to make recommendations for its prevention inspires hope that at any rate the contribution which the gas industry can make to the solution of the problem will not be overlooked. Shortly after the appointment of the committee was announced, the *Manchester Guardian* reproduced from the *British Medical Journal* a chart showing the death rate from bronchitis in different parts of England and Wales, and commented editorially on the fact that men over 45 living in Manchester or on Tyneside stand twice as much chance of dying of bronchitis next winter as men of the same age in London. Londoners themselves, it was said, are nearly twice as likely to die from bronchitis as those who live in the southern English countryside. These shocking facts were brought out in a survey of bronchitis by Professor R. E. Lane, Miss Nancy Goodman, and Dr. S. B. Rampling, of the Nuffield Department of Occupational Health in Manchester. Smoky industrial areas show a severe incidence of bronchitis and respiratory troubles, and the *Guardian* says 'There is no doubt that the smoke poured into the air over industrial towns is a killing factor; and where it does not kill it can maim for life.' We take bronchial affections too lightly. As Professor Lane and his collaborators observe: 'For many years this crippling disease has been complacently accepted, and that cough bottle has been one of our national institutions.' Smoke is largely preventible, and national determination to clean up the air we breathe might not only end much chronic ill health but save a great deal of money into the bargain. With these thoughts in mind we are glad to learn that the committee on air pollution has lost no time in getting down to its important task.

CHEMICAL ENGINEERING

The concepts on which the chemical engineering profession is founded are simple—that the large-scale manufacturing of many substances, particularly chemicals, can be studied as a series of single steps. Some of these steps, called 'unit operations,' are physical operations like mixing or drying. Others are chemical and are called 'unit processes.' The number of these steps is comparatively small, and if the principle of each one is understood, the knowledge of it can be applied to the manufacture of quite different substances. This is underlined in a booklet, *Careers in Chemical Engineering*, just published by the Institution of Chemical Engineers (price 2s. post free). Since 1914, and particularly since 1922, which year saw the formation of the Institution, now a professional body of wide interests and great influence. The booklet we mention is of much interest. There is no question that more chemical engineers are wanted than are being trained at present. The chemical industries are growing fast and chemical engineering skill is becoming more and more important in these industries. There is no shortage of jobs for trained and capable men. Of course, the training is both lengthy and thorough—but rewards do lie ahead of it. Survey has shown that chemical engineers are working in a variety of fields, in about the following proportions: Chemical industry, 50%; chemical plant manufacture, 15%; oil industry, 10%; gas industry, 8%; Government departments, 3%. In regard to training, there are full-time university and full-time and part-time technical college courses. Whatever the training, however, advancement of the young chemical engineer to a senior position following qualification depends not only on the application of knowledge gained by study, but also on the exercise of judgment based on experience. This experience should be progressive, so that as he matures the chemical engineer can undertake responsibilities over a broad field. The more he can enrich his skill, both in technical matters and in human affairs, by understanding and experience, the broader is the way before him.

THE ELECTRICITY SUB-COMMITTEE of the joint consultative committee on load spreading has published its report regarding the prospects for the coming winter. The principal recommendations of the committee—and the Government has accepted them—are: That there should be no national load-shedding target (last year the target was 10%) but that the regional boards for industry should make local arrangements in the light of conditions likely to arise locally; that all possible encouragement should be given to the use of private generating plant; and that domestic and small commercial users should be asked to exercise the greatest possible economy during the winter peak hours (from 8 a.m. to noon and from 4 to 5.30 p.m. on Mondays to Fridays).

Personal Notes

SOUTH EASTERN APPOINTMENTS

The South Eastern Gas Board has made the following appointments to take effect from October 1: MR. L. F. RANDALL, M.INST.GAS E., to be Deputy Commercial Manager; MR. E. W. ATKINS, M.A., M.INST.GAS E., to be Manager, Special Service Department, and MR. R. M. MUNNS, M.INST.F., M.INST.GAS E., to be Sales and Service Manager, East Surrey Division.

MR. L. F. RANDALL received his early training with the South Metropolitan Gas Company, and at the age of 26 was appointed Assistant Manager of the South Eastern Division of that company. This involved work in connection with sales and service to 105,000 consumers. In 1938 he was placed in charge of a section which was formed to develop the sale of gas on the company's area by means of a recently introduced two part tariff to large commercial consumers, hospitals, Government departments, local authorities, and multiple trading companies, but at the outbreak of war he returned to the South Eastern Division to take over the duties of Manager. Three years later he was appointed Superintendent of the Industrial and Commercial Gas Sales Department, and at the time of nationalisation this department was re-organised and as the Special Service Department became a headquarters section attending to matters relating to the development of special uses of gas such as industrial, public lighting, new housing, large scale heating, and other commercial purposes. Mr. Randall was one of the members of the British Gas Industry Productivity Team which visited America last year.

MR. E. W. ATKINS joined the firm of Mott, Hay & Anderson, Consulting Engineers, of Westminster, as a pupil and remained to carry out a number of important contracts mainly in the construction of railway and road bridges. In 1933 he was appointed Commercial Manager and Distribution Engineer to the Bath Gas Company. From 1939 to 1945 he carried out the duties of the Controller of the A.R.P. services of the company and was responsible for restoring the gas supplies to the city of Bath during the heavy air raids in that area. In 1946 he was appointed a senior executive officer of De La Rue Gas Development, Ltd., a post which carried with it the position of General Manager of the water heating division. His duties involved equipping and starting up production in the firm's new factory at Gateshead-on-Tyne. In 1947 he accepted the appointment of Administration Officer to the North Eastern Trading Estates, Ltd., an organisation responsible for developing industrial trading estates in Northumberland, Durham, and the North Riding of Yorkshire. Mr. Atkins returned to the gas industry in 1949 when he became Sales and Service Manager of the East Surrey Division of the South Eastern Gas Board. He has been generally responsible for the large scale gas installations at Crawley New Town.

MR. R. M. MUNNS entered the service of the Gas Light and Coke Company in 1929 and received general training covering a period of three years in the gas sales and service department, including office and showroom experience and practical gas fitting. In 1932 he was appointed a district representative and became senior representative of a district office in 1934. From 1935 until the outbreak of the war he was a member of the company's Special Service Section, engaged on the installation of gas supplies in large buildings in the Central and West End districts of London, and during the latter part of this period specialised in central heating and hot water installations. At the outbreak of war he was transferred to the distribution department. Mr. Munns joined the Royal Air Force in 1942. After the war he returned to the Gas Light and Coke Company and was on the personal staff of the Commercial Manager from 1947 until 1949, when he joined the South Eastern Gas Board as Sales and Service Manager of the Kent County Division.

MR. T. P. REAY, Southern Area Manager of Cannon (GA), Ltd., has been appointed a Director of that company.

MR. F. C. REA, O.B.E., of Portsmouth, has been appointed by the Minister of Fuel and Power to be Chairman of the Southern Gas Consultative Council in succession to Alderman J. W. Moore, C.B.E., who, on account of age, was not re-appointed on the completion of his initial term of office. Mr. Rea, who thus becomes a member of the Southern Gas Board, is a solicitor and a past President of the Portsmouth Chamber of Commerce.

MR. A. J. M. HENSHAW, son of the late Mr. D. M. Henshaw, and MR. W. SYKES have been appointed Directors of W. C. Holmes & Co., Ltd. John Henshaw served his time, after leaving the university, with Head, Wrightson & Co., Ltd., and from there went into the Army. On his return after demobilisation he joined W. C. Holmes & Co., Ltd., and is now acting as Contracts Manager. Mr. Sykes joined the company 31 years ago as an apprentice, and has remained with it throughout his career. He is now Manager of the department dealing with the problems of electrical and mechanical extraction of dust and liquids.

Diary

Sept. 1.—EAST MIDLANDS G.C.C., Victoria Station Hotel, Nottingham, 11.30 a.m.

Sept. 1.—SOUTH EASTERN G.C.C.: Gas Board offices, Katharine Street, Croydon, 2.15 p.m.

Sept. 3-9.—BUILDING PLANT EXHIBITION, organised by the Ministry of Works. Goose Fair Site, Nottingham.

Sept. 3-17.—ENGINEERING, MARINE, AND WELDING EXHIBITION (including Chemical Plant Exhibition). Gas Council exhibit. Olympia.

Sept. 9.—SOUTH WESTERN G.C.C.: 34, Bridge Street, Taunton, 11 a.m.

Sept. 10.—WALES AND MONMOUTHSHIRE SECTION, I.G.E.: Annual General Meeting, Carmarthen; Discussion on the Report of the visit of the Gas Industry Productivity Team to the United States to be opened by E. M. Edwards, Member, Wales Gas Board.

Sept. 15.—IRISH GAS ASSOCIATION: Annual Meeting, Tramore.

Sept. 15-18.—ASSOCIATION OF PUBLIC LIGHTING ENGINEERS: Annual Conference and Exhibition of Street Lighting Equipment (including Gas Council display), Liverpool.

Sept. 23.—SCOTTISH ASSOCIATION OF GAS MANAGERS: Annual General Meeting, Edinburgh.

Sept. 25.—MANCHESTER AND DISTRICT SECTION, I.G.E.: Visit to Petrochemicals, Ltd., Irlam, Manchester.

Correspondence

INSULATION

DEAR SIR,—I notice in your issue of July 29, under the heading 'In Parliament,' some comments about Mr. Stokes' statement in the Commons. I took it for granted when I read the report of his speech that the £14,140 was the cost of the insulation. Do you not think this is probably what he meant?

Yours faithfully,
R. F. TWIST,
Works Manager.

Tar Works,
South Eastern Gas Board.
East Greenwich, S.E.10.

[So there you are!—perhaps, after all, ambiguity is the hall-mark of great political oratory.—Ed. *G.J.*]

DEEP PURIFIERS

DEAR SIR,—I would like to correct a wrong impression given by your Editorial Comment on my paper on 'Deep Purifiers' in your issue of July 22. You imply that I was advocating the use of the deep purifier in opposition to various alternative types of purification plant, which you list as being under development at this present time. This was not my intention and I do not think that it was understood by the members of the Eastern Section of the Institution present at the meeting.

I made specific reference to these other types of plant which are being developed and the main objective of their development, the alleviation of the labour problem in purification, but I made the point that not one of these plants has yet achieved complete success.

To my knowledge, hundreds of thousands of pounds worth of purification plant is being installed at this moment in more or less conventional form and the intention of my paper was to make available useful data on the deep purifier by which an engineer might assess its suitability for its purpose.

When we have available a proven plant which can compete technically with the good points of a box purifier while eliminating its disadvantages, particularly in respect of the handling of oxide, the situation will, of course, be very much changed.

Yours faithfully,
R. WHITING.

Ipswich, August 6, 1953.

Gas in FRANCE

abstracts from the French technical press by 'ASHTON'

THE ridiculous hotch-potch of weights and measures which constitutes the Anglo-Saxon 'system' excites the mild sarcasm of the Editor of *Chimie et Industrie* (April). He points out that today the metric system has been adopted by three-quarters of the Globe. The remaining quarter he describes as 'an island where the Anglo-Saxon units still reign.' We may observe that this island contains a vastly disproportionate mass of the articles to be weighed and measured, but we can sympathise with the inconvenience caused to the outer regions by the multiplicity of units of lengths employed by the 'islanders.' He therefore notes as an encouraging symptom information given at Copenhagen in October last by British delegates to the Committee of the International Standards Organisation that in a Bill now before Parliament the yard is to be defined in terms of the metre with a length of 914.4mm. This is precisely the conversion factor already laid down in S.R. & O., 1898, No. 411, Weights and Measures Metric Equivalents, re-issued in 1927. It appears that the distance between the marks on the two gold plugs in the platinum bar (we describe from memory) which at present defines the legal yard shows a tendency to shorten a little!

Coke Oven Tar for Heating

Coke oven tar has been used in the heating of the Martin steel furnace. M. Ch. Tixier summarises the position in the *Journal des Usines à Gaz*, March, 1953. Its use as a substitute for heavy oil added to the usual gases is justified by reason of the improvement effected in the luminosity of the flame and of heat transmission by radiation because of the high carbon content of the mixture, and of the relative absence of ash and sulphur. The difficulties reside in the complete atomisation of the tar and the realisation of complete combustion with the minimum of excess air. Points noted on the preparation of the tar before atomisation and on the behaviour of the flames are: (a) It is necessary to watch the variations in water content and viscosity (these variations being greater than those in heavy oil) and to make the necessary corrections; (b) the tar needs to be heated to give it the necessary fluidity, but the temperature need not exceed 65°C. (at the 100°C. adopted for fuel-oil, difficulties arise from the distillation of the tar); (c) excess pressure of the compressed air used for atomisation gives rise to valve leakage; (d) particles of carbon in suspension in the tar vapour are severer on the brickwork than fuel oil. The same type of burner as for fuel oil serves for the use of tar. Generally used in admixture with gases tar can be used alone and provided that the refractories are suitable there is a remarkable reduction in fusion times, but in view of the fluctuations in tar prices it cannot be said to present a definite economic advantage over fuel oil. Tar has also been used for the heating of retort settings, generally as an addition to coke, but this practice has been abandoned since about 1909.

'Technical Jargon'

Our French colleagues are exercised, too, about the adoption of what presumably they would call Anglo-Saxon words in technical terminology. They object to the invasion of their language by English words, admitting, however, that there might be domains, the petroleum industry, for example, where the adoption of a whole block of terminology might be justified by the difficulty of replacing it by French words of equal clarity. But there is a risk in the use of foreign words where different signification is concealed in words of apparent similarity. M. Combel had objected before the war to the use in French literature of the English 'steaming'; the words 'injection de vapeur' (injection of steam) would express all one wished to say. 'If we are not careful,' he added, 'we shall in a few years be talking in an extraordinary technical jargon, useless in most cases.' The Committee of the Association Technique de l'Industrie du Gaz has appointed some of its members to enquire into words in the technology of gas of foreign origin, which may be considered as intruders and to suggest French equivalents which might be expressive without being ridiculous. The task is not easy and no doubt some words will be difficult to replace as, for example, those of American origin in the technology of water gas: up-run, down-run, back-run. But the operation is deemed to be well worth attempting.

MM. Delaruelle (Director of Transmission), Kammerer, and Renouard (Engineer to the Gaz de France Research Department) contribute to the *Journal des Usines à Gaz* (April) calculations of the stresses in overhead gas mains of considerable span. They suggest that for small or medium diameters it would be interesting to consider overhead pipelines with an appreciable deflection similar to that of overhead electric cables, such as, for instance, a deflection of 1 metre with a span of 50 metres. The pipe would be subject to four kinds of loading: (a) The direct action of the pressure of the gas; (b) the transverse action of the pressure; (c) the longitudinal stresses due to the weight of the pipe which would need to cover the weight of the tube itself, the weight of water contained in the tube for testing purposes, the effects of wind, snow and frost; and (d) stresses set up by the curvature of the pipe. Calculations of these stresses are set out in detail.

The calculations show that the installation of overhead connections appears to be possible up to a diameter of 150 mm. (say 6 in.). In each case, there is an optimum deflection for a minimum of anchorage forces. For a diameter of 100 to 150 mm. and a span of 50 metres optimum conditions correspond to a deflection (sag) of about 1 metre. It is precisely pipes of these diameters where the relative importance of costs of underground installations (trenching and protection against corrosion) is at the maximum. It would appear then that in certain cases overhead mains and services might be considered.

Petroleum Oils for Gas-Making

M. F. Delarozière, former engineer in the Research Department of Gaz de France, reviews, in the *Journal des Usines à Gaz*, April and May, American publications on the selection of petroleum oils for gas-making, whether in carburetting water gas or in the direct production of oil gas. He points out that the properties of the oils available for these uses are continually varying and particularly that these oils are becoming 'heavier,' presenting growing difficulties in cracking. They are residuals from at least four methods of oil refining, distillation at atmospheric pressure, thermal cracking, catalytic cracking, thermal re-cracking. For the carburation of water gas, oil quality is evaluated in the first place by its enrichment value, measured by the therms furnished by the cracking of unit weight. It depends mainly on the C/H ratio, but other properties affect it and formulæ and graphs have been evolved showing how these affect the C/H ratio, and the value of the oil as an enricher. The production of oil-gas is similarly treated. The author emphasises that for a complete study of the subject the American originals should be read.

A 'Service' of New Techniques was set up by Gaz de France in March, 1952. Its functions are now described. On the one hand it is to carry out trials on an industrial scale of new techniques in the production, treatment, and transmission of gas, the manufacture and treatment of coke and of residuals generally. On the other hand, it is to assure the documentation and co-ordination of technique among the several other departments of Gaz de France, placing at their service all information about the

industrial applications of technique in the industry. M. A. Bolzinger is placed in administrative control assisted on the technical side by M. R. Delsol.

Progress of the Gas Industry in France

M. J. Mothes, Engineer to the Commercial Department of Gaz de France, summarises the official statistics for 1951 just published and the provisional statistics for 1952 which, he says, again shows the growing importance of the gas industry in the economy of the country. He notes that petroleum products, such as butane, are omitted from these statistics, but they are by no means negligible for while the tonnage of coal carbonised in 1951 was nearly 15 mill. tonnes, gasworks and coke ovens used 42,000 tonnes of petroleum products, mostly paraffin distillates.

In the course of the six years since 1946 gas production has increased by 17%, coke by 77%, and tar 38%. The total gas send-out, including that purchased for distribution, increased by 28%. In the same period the total effective personnel employed decreased by 7%. Compared with 1951, gas production advanced by 2.4%, but the tonnage of coal carbonised rose by 5%—that is, by more than the growth in gas production. This result indicates the tendency to the development of coke production, which advanced by 9.2 per cent.

M. Poirier, chief of the Andelys Sub-division, and M. Aubry, of the meter service of the sub-division, have worked out an automatic method of determining leakage in the distribution system. The method generally employed, they say, is to measure during the hour of minimum consumption—i.e., about 1 o'clock in the morning—the output of gas deducting known consumptions at that time. During this hour readings are taken over periods of 2 min.—the minimum representing the magnitude of the leakage. But to take such readings requires the services of at least two skilled operators and these are not readily available on a small works. MM. Poirier and Aubrey have have therefore devised a recording meter with a travelling tape driven by a synchronous motor and arranged to register the meter readings at the required intervals. This apparatus is described with schematic drawings in the *Journal des Usines à Gaz*, May, 1953, p. 146/7.

Gas Week, 1953

'Gas Week,' 1953, was opened on April 21 by M. Jean Kec and was attended by 415 persons, including the principal personalities in the gas industry. Among the papers presented was 'Reflections on the present-day technique of industrial gas turbines,' by M. Sedille, Technical Director of the Rateau Company. Overall thermal efficiencies are 15% for simple arrangements to 32% for the more complicated cycles, approximating to that of the steam power stations. Encouraging results have been obtained by the Rateau Company with heavy oil as the fuel, but the direct use of pulverised coal is deprecated on account of the consequent wear and tear of the rotors. Combinations of gas generators and turbines present several advantages. We referred to these developments in a previous abstract under the heading "Gas in France."

MM. Fischer (Research Department) and de Jerphanion (Industrial Service, Gaz de France) dealt with applications of infra-red radiation in industrial heating and large scale space heating. The apparatus consists essentially of finned cast-iron panels heated by 'blue' gas flames. Results compare favourably with other methods.

M. Mothes discussed the theory and practice of investigations by *sondages*—samples taken at random—particularly in application to the study of markets. The gas industry, for instance, has to deal with a very large number of consumers of great diversity of requirement and it appears that only by taking sections, as it were, of the market and in random samples can sufficient information be obtained upon which to base commercial policy. M. Mothes is of the opinion that experience in this method shows that its judicious use reveals a high degree of efficiency.

M. S. de Sacy, of one of the Paris Groups, discussed the rôle and organisation of control in gas manufacture and application. It is interesting to note that in his district the travelling laboratory has been found of great use in the control of small and medium sized works which have not themselves the technical equipment or personnel for these duties.

Electricity in Telemeasure

M. Pannetier, Director of Production and Transmission of Gaz de France, discussed, somewhat theoretically, the use of electricity in telemeasure in the gas industry, the transmission of measurements and indications at a distance for control purposes, rendered necessary by the concentration of production and distribution over long distances, particularly to assure equilibrium between production and demand for gas. The information generally transmitted are pressures, outputs, state of gasholders, calorific values, densities, totalisations of terms of the same nature, levels of water in boilers or tanks, temperatures, much more rarely composition of gases or at least their CO_2 content. Several combinations of direct and alternating current are used with proportional voltage, impedance, induction, or frequency. In some instances impulses are employed with number, density or duration proportional to the values to be transmitted. The combinations and selections of type vary with the distances to be covered.

M. Bolzinger discussed modern techniques of solid-gas reactions in the gas industry. Instances are gasification of fines and fluidisation for gasification, catalytic cracking of oils, oxide purification in fluidised beds.

M. Combet dwells at length on the psychological effect on workers of clean, well-lighted, suitably coloured workplaces and apparatus. Industrial architecture is not an art to please the eye. The works is not built to capture the admiration of the visiting amateur, or to provide fine views for the journalist's photographer. Any beauty it may possess should be analogous to that appraised by the stock-breeder who judges of the qualities of a fine animal not by the perfection of its grooming but by the outward signs of skin and form which indicate its internal economy. At the same time one must break the armour of ugliness, drabness, and oppression which too often characterises the repulsive decor of existence in a factory. Let us open the windows—aerate the life of the works, give it colour, a natural warmth, a human feeling.

Gasworks Architecture

The concluding article by M. Georges Combet, Director-General of Gaz de France, 'Notes on the architecture of gasworks,' appears in the June issue of the *Journal des Usines à Gaz*. The title is 'The men and the works.' It is directed against industrial ugliness. It emphasises the importance of minimising the emission of dust, dirt, evil smells, unnecessary noise. The continuous vertical retort is instanced as a system in which the smoke, dust, and steam incidental to gas manufacture are suppressed, but even with the coke oven, dry quenching can obviate steam emission and the dust of charging can be avoided by putting the oven under vacuum (by means of injectors) during this operation. Dust in coal and coke handling can be reduced by careful design of chutes avoiding unnecessary falls in the open from one to another and by enclosing, as much as possible, chutes, breakers, and screens of coal and coke. A works can only remain clean if road and yard surfaces are well paved and as far as possible capable of being flushed with water. The surfaces of buildings should be smooth and clean, free from decorations capable of retaining dust, and readily washed by rain. Currents of air which might carry dust should be studied carefully and provided with exits so designed as to prevent accumulations on walls and partitions. 'Never fix any element whatever which may wear or break without thinking of ready replacement. Windows must be arranged to be readily cleaned and repaired. Lighting apparatus must be easily accessible.'

The Annual Congress of the Association Technique du Gaz was held at Nice on June 15 to 20 under the Presidency of M. Kec. The usual large number of papers, 36, were presented. These will be briefly abstracted in a future article.

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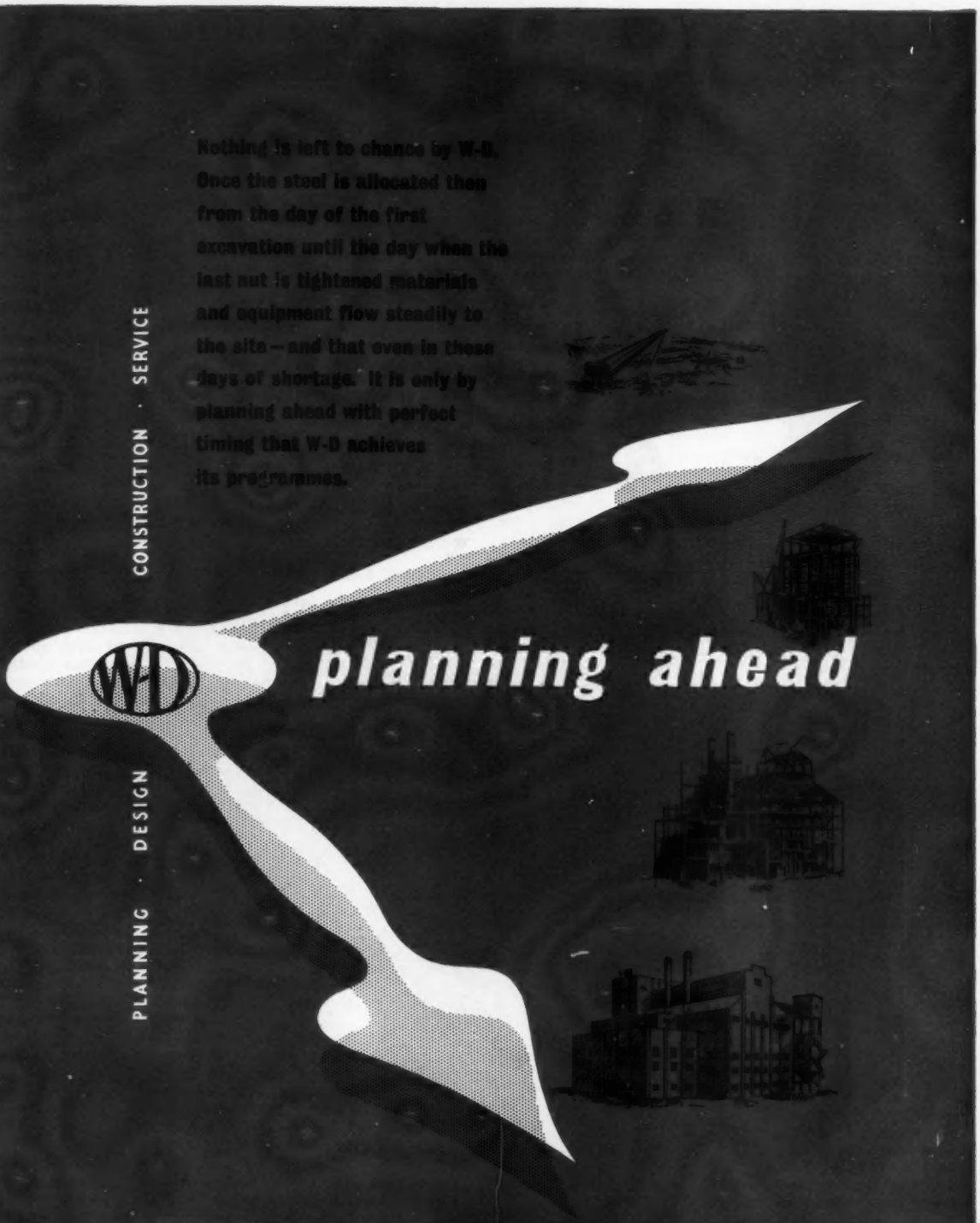

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DEVELOPMENTS IN THE WALES AREA*

PAPER TO THE WALES AND MONMOUTHSHIRE JUNIOR GAS ASSOCIATION BY

E. M. EDWARDS,

M.Inst.Gas E., M.I.Mech.E., Member, Wales Gas Board.

THE plant at the new Maelor works on the outskirts of Wrexham, which is to be opened by Lord Lloyd, Under-Secretary of State for Welsh Affairs, on October 14, includes automatic coal handling plant for dealing with road-borne coal. Future provision is made for rail handling, but in present circumstances road handling is more economic.

An unusual feature is the provision of jacking facilities to provide for the re-levelling of the structure if settlement is experienced. Other plant is as detailed below.

Gas coolers, electrostatic detarrers, ammonia washers, light oil washer, Connersville meter, Dri-gas plant, all of 5 mill. cu.ft. per day capacity.

Roots type steam driven exhausters of 5 mill. cu.ft. per day capacity exhausting to low pressure steam system for process work.

Two Economic type boilers, capacity 6,000 lb. steam per hour each at 150 lb. per sq. in. These will be coke breeze fired with mechanical grates.

One ½ mill. cu.ft. capacity 3-lift spiral guided riveted holder.

One ¼ mill. cu.ft. capacity 2-lift spiral guided all-welded holder.

Two 250 kW alternators each driven by 365 B.H.P. compound condensing engines.

Roots type compressors at 6 lb. per sq. in. for the Southern supply, and reciprocating compressors at 15 lb. per sq. in. for the Northern supply, all steam driven in the same manner as exhausters.

Cooling tower, concentrated liquor plant, and various ancillaries.

Delay in the supply of steel main means that the new works will come into commission before the Northern pipeline to Deeside is completed, and initially the works will serve Wrexham, Rhos, Cefn Mawr, and Llangollen.

The interconnection of Rhyl and Prestatyn has been completed, and the latter operates as a base load station.

St. Asaph will be supplied in bulk from Rhyl within the next few months.

Conway gasworks has ceased operations, as supplies in bulk are now provided from Llandudno and Colwyn Bay.

As a short term measure mechanical D.B. chain-type coke handling plant has been installed at Llandudno to enable the horizontal retort house to be worked to greater capacity. A new continuous vertical retort plant of 800,000 cu.ft. per day capacity, with other plant, is under construction at Colwyn Bay.

At Bangor, a reconstruction scheme to meet the requirements of the near future is in progress. This includes the installation of mechanical plant for handling coal and coke, new wet and dry purification plant, and compressors for providing bulk supplies to Beaumaris, Bethesda, and Menai Bridge. The main to Bethesda will be completed in 1953. Menai Bridge is temporarily supplied in bulk from Beaumaris.

An interesting problem is that of taking a steel main over the Menai Suspension Bridge. Final details have not yet been settled, but the proposals formulated provide for the main to be carried underneath the main span, secured appropriately, and provided with suitable means to ensure flexibility.

In the North Wales area John Summers and Co. operate coke ovens in the Shotton, Deeside, area, but no arrangements are at present made for purchasing coke oven gas from this source, although this is a possibility that must be borne in mind.

Preliminary examination only has been made of the possibilities of an integrated scheme for Pembrokeshire, based upon Pembroke Dock. This scheme will be examined in detail in the near future.

* *Continued from p. 341, Gas Journal, August 5.*

Included in investigations made into alternative methods of gas supply for small gas undertakings was consideration of the use of liquefied petroleum gases for the following purposes:

(i) Substitution of butane or propane air mixtures in place of orthodox methods of gas supply at existing small undertakings where the provision of bulk gas supplies would not be economic.

(ii) The provision of neat propane supplies to those towns where gas supplies are no longer available, the original gas supplies having ceased many years ago.

(iii) The provision of neat propane supplies to small towns, villages, and large groups of houses, that have never had a gas supply.

(iv) The substitution of butane or propane water gas mixtures in place of orthodox methods of gas manufacture at existing undertakings.

(v) The provision of butane or propane/producer gas auxiliary supplies at medium sized (and possibly at large) gasworks, for peak load purposes.

After examination of many technical factors involved, the small Whitland undertaking was used as an experimental station for testing the possibilities of supplying a butane/air mixture of a calorific value of 730 B.Th.U. per cu.ft., specific gravity 1.22, and oxygen content 16.2%, in place of the coal gas formerly supplied.

After 15 months operation it can be said that the process is technically sound, it operates with reliability, and provides an excellent service to the consumers. Commercial success will be dependent upon the terms for the purchase of LP-gases from the oil refineries.

Additional plants are to be installed at Fishguard and Llanidloes.

If the use of LP-gas as is to be developed by the gas industry in Great Britain, a standard code of practice should be prepared, covering the design, installation, and operation of all equipment, and especial regard paid to fire and explosion hazards with transport and storage equipment.

Apart from the major stations included in the gas grid programmes, there are undertakings such as Holyhead and Aberystwyth that are relatively isolated, and they will probably remain as modern coal gas manufacturing units. For the smaller isolated units constant investigations are being made into alternative and improved methods of production, the use of LP-gases being one of these alternatives.

Features of Plant Design

Gasworks plant must be reliable in operation for long periods of continuous use. This is an over-riding feature of design in view of the essential need for gas supplies to continue without interruption. Considerations of high thermal efficiency, and maximum economy in labour and maintenance, consistent with an adequate return upon the capital invested, are self-evident.

The abrasive nature of coke and coke dust, and the corrosive nature of certain of the materials, gases, and products dealt with present particular problems to the designer. Fire and explosion hazards have to be borne in mind, and most electrical plant must be flameproof if installed in situations where there is any possibility of gas concentrations being experienced.

Plants that are only required for short period peak load operation should be economical in design and, in some such instances low capital cost is more important than exceptionally high operating efficiency. Before new peak load plants are installed consideration should always

be given to possible means of increasing the effective capacity of existing plants; if necessary, by unorthodox means.

Mains and Metals

The total length of mains operated is some 3,200 miles, excluding services. Each year, excluding grid mains, about 100 miles of additional mains are laid. The use of modern mechanical tools for mainlaying operations is being pursued and developed. Most new mains are spun iron with mechanical joints, although when steel is more readily available there will be a tendency to the increasing use of steel, especially in mining areas where ground movement is prevalent.

Recently, a young engineer has been appointed with the specific task of investigating the use of cathodic protection, and impressed current, for minimising corrosion of underground pipe systems and of gasholders and other structures. This work is now in progress. Experience upon the Continent and in the U.S.A. is apparently that these methods can extend the useful life of the systems to at least twice that normally experienced. If this can be proved, and authorised amortisation periods for spun iron and steel mains extended, it will have a most important bearing upon distribution costs and the economic distances for gas transmission.

Gasholders

Gasholders represent essential and expensive features of all operations. Among the advantages of an integrated grid system is that the diversity factor, and other reasons, enable operations to be conducted with a lower ratio of gasholder capacity to the maximum daily demand. With a developing industry this is of importance. Despite this, we have a substantial gasholder erection programme, as indicated by Table 9.

TABLE 9.

(a) *Erected*

Undertaking	Location	Capacity cu. ft.
Holywell and Flint	Flint	200,000
Ruthin	Ruthin	100,000
Prestatyn	Prestatyn	125,000
Haverfordwest	Haverfordwest	150,000
Rhayader	Rhayader	20,000
Abercarn	Abercarn	250,000
Monmouth	Monmouth	80,000*
Conway	Conway	100,000*
Newport	Bishpool	30,000*
Maesteg	Maesteg	30,000*
Towyn and Aberdovey	Towyn	16,000*
Portmadoc	Portmadoc	30,000*
Cardigan	Cardigan	30,000*
Hay	Hay	8,000*
Llanberis	Llanberis	8,000*

(b) *Under Construction*

Newport	Mendalgief	2,000,000
Rhymney and Aber	Caerphilly	750,000
Rhymney and Aber	Nelson	70,000
Port Talbot	Aberavon	1,500,000
Blackwood and District	Pontllanfraith	200,000
Llangefni	Llangefni	35,000
Wrexham	Maelor	500,000
Amlwch	Amlwch	16,000*
Welshpool	Welshpool	16,000*

c) *On Order*

Undertaking	Location	Capacity cu. ft.
Neath	Neath	1,000,000
Bridgend	Bridgend	500,000
Rhymney and Aber	Pontlottyn	250,000
Wrexham	Maelor (C.W.G.)	250,000
South Wales Grid (Eastern Section)	Nantgarw	2,000,000
Garw and Ogmore	Garw and Ogmore	30,000*
Bethesda	Bethesda	8,000*

* High pressure receivers.

Up to the present we have standardised on the spiral guided gasholders are more expensive in initial and guided gasholders are more expensive in initial and maintenance cost.

Gas Made and Bought

The gas made and bought for the year ended March 31, 1952, is shown in Table 10, the gas made in Table 11, and coke oven gas purchased in Table 12.

TABLE 10.

Year ended March 31, 1951			Year ended March 31, 1952	
%	therms		%	therms
50.4	39,940,776	Gas made*	43.1	35,639,522
49.6	39,329,578	Gas bought from coke ovens	56.9	46,994,561
100.0	79,270,354		100.0	82,634,083
	775,549	Gas used by undertakings		824,740
	78,494,805			81,809,343

* After benzole extraction.

TABLE 11.

Year ended March 31, 1951			Year ended March 31, 1952	
%	therms		%	therms
84.7	33,811,416	Coal gas	88.2	31,423,312
15.3	6,003,105	Water gas	11.8	4,127,510
	125,255	Producer gas		88,700
100.0	39,940,776	TOTAL	100.0	35,639,522

TABLE 12.

Quantity purchased (therms) year ended March 31, 1951	Supplier	Quantity purchased (therms) year ended March 31, 1952
16,193,485	Guest, Keen, Baldwins Iron and Steel Co., Ltd., Cardiff	16,003,529
6,650,720	Steel Company of Wales, Ltd., Margam	8,200,954
5,646,629	British Benzole and Coal Distillation Co., Ltd., Bedwas	5,672,789
—	National Coal Board, Nantgarw	5,277,075
3,800,868	National Coal Board, Bargoed	3,918,988
2,927,299	National Coal Board, Coedely	3,546,298
2,921,344	National Coal Board, Maritime, Pontypridd	3,068,763
760,309	National Coal Board, Tondu	807,480
428,924	National Coal Board, Phurnacite Plant, Aberdare	498,685
39,329,578		46,994,561

In Glamorgan and Monmouthshire 70.6% of the total quantity of gas available was supplied by coke oven plants. The steel industry provided 51.5% of the gas purchased in bulk, independent coke ovens 11.23%, and the National Coal Board 37.27%.

Mr. Edwards was unavoidably prevented from being present at the meeting; his paper being read by **Mr. R. A. Jones**, Wrexham.

DISCUSSION

Mr. H. Buckley (President) said the aspect of the paper which interested him most was the possibility of using methane. He felt that its importance to the gas industry, and to the Wales Gas Board in particular, was dependent on the price and the quantity available. He asked Mr. Jones for more information regarding methane, particularly regarding the reforming process. What he particularly liked about the use of methane was its versatility in the ways it could be used and he had made calculations and estimated that, if it were mixed with blue water gas, the use of coke would be involved, and he found that one would require about 2½ cu.ft. of water gas per cu.ft. of methane to bring it down to approximately 500 B.Th.U. In addition, there would be required 1 cu.ft. of coal gas to make the coke required for the blue water gas if a completely balanced works was desired. He asked Mr. Jones if he could say something more regarding the combustion characteristics of the final gas produced by the various methods.

In regard to continuity of supply, he presumed that the methane from one area would become exhausted and one would have to move to an adjacent area. He also asked what was the potential in Wales divided up between North Wales and the South Wales eastern and western areas. He assumed that the gas would be withdrawn at a constant rate and that it would not be possible to keep it back to meet peaks so that gasholders would still be required.

He asked whether in the central grid room it was proposed to employ press-button control of motorised valves at distant points. Regarding cathodic protection, he felt that this was of great interest in view of the fact that the capital costs on the mains would be reduced if the depreciation period could be extended with a longer life, and he asked if the engineer who was doing this work would elaborate on it somewhat. Concerning the breeze-fired boiler, he asked Mr. Jones if he could explain what evaporation could be expected and tell them whether or not this type of boiler was really satisfactory.

Mr. R. A. Jones stated that reforming was accomplished by passing the methane, together with steam, through a hot bed of coke. The resultant chemical reaction resulted in the formation of carbon monoxide and hydrogen. By this means, some 600,000 cu.ft. of methane at 980 B.Th.U would give double that quantity of gas at 475 B.Th.U. Alternatively, cold carburretting could be practised, in which case 600,000 cu.ft. of methane would give approximately 2¼ mill. cu.ft. of diluted gas also of a calorific value of 475 B.Th.U. per cu.ft.

Concerning continuity of supply, he said that this was a question to which he could not give a definite answer. Only a small percentage of the coal seams had been worked and it was reasonable to assume that there were considerable reserves of methane in coal seams as yet untapped. Perhaps it was sufficient to say that the National Coal Board was very confident regarding the quantities. The methane would be withdrawn at a reasonably constant rate. The calorific value and purity were of particular interest. The calorific value was very constant and the methane from the Point of Ayr Colliery was 98% pure. He could not say what the purity would be in respect of methane from the South Wales mines but he did not think that an equivalent degree of purity would be a feature of the methane from this source. Regarding the efficiency of breeze-fired boilers, in the absence of practical knowledge and experience he was reluctant to express an opinion.

Mr. A. D. Mason (Cardiff) said that the grid control room plans were not yet finalised. It was anticipated, however, that actual control would be effected from a remote point by controlling the volumetric governor. The volumetric governor would control the height of the holders and the pressure in the grid system, etc.

Mr. J. F. Day (W.G.B. Headquarters) said that work was continuing on cathodic protection at Board Headquarters, and that cathodic protection had been applied successfully in America where it was now taken as an accepted practice. It had been possible to reduce pipe thickness by 20% as a consequence. The problem one had to solve was its application economically and satisfactorily. One had to determine which system to employ, either sacrificial anodes or impressed current, bearing in mind that the former were only effective in low-resistivity soils. He thought the tendency would probably be to use the impressed current system, particularly in view of the intention to use steel mains at high pressures.

Mr. S. G. Meade (Newport) said he was interested in the provisions being made at the Wrexham works for jacking-up buildings should they sink due to subsidence, and he asked Mr. Jones to say something regarding this.

Mr. Jones said that provision had been made in every stanchion carrying the buildings and the settings, so that if any settlement took place re-levelling by jacking could be effected.

Mr. Briggs (Barry) said he assumed the new Wrexham works would be using coal from nearby collieries. He asked whether any loss in calorific value was anticipated over the distance the gas would be pumped. He also noted it was intended to install Roots type exhausters which were apparently favoured more than the old blade type. His experience had been that the bearings on the Roots type tended to wear out quickly and wondered whether anyone else had a similar experience.

Mr. Jones, in replying, stated that local coals would be used at the new Wrexham works and that he had no experience with the Roots type exhausters. He felt, however, that the Board's decision had been made with every confidence that they would satisfactorily do the work required of them.

Mr. Mason said that experience to date did not indicate that there would be any loss of calorific value with long distance transmission.

Mr. E. W. Eaves (Colwyn Bay) said he would be interested to know whether the mainlaying in the Eastern grid was carried out by direct labour or contractors. He would also like to know what arrangements had been made for the upkeep and maintenance of the land, what protection was employed, and at what intervals anchorage was arranged.

Mr. Mason, replying, said that the work of mainlaying was carried out by gas undertaking mainlayers, unskilled labour being drawn off from undertakings in the area or enlisted through employment exchanges. The work was performed under the direction and supervision of technical personnel from Board Headquarters. Regarding protection, he said that the values of various bitumastic paints were under observation and experimental work was being done. Maintenance schedules had been drawn up and maintenance was being carried out by the undertakings responsible for any particular section. All routes were walled by Headquarter's staff at stated intervals. Anchorage varied with the size of the pipe and the lay of the land, etc. Details were worked out scientifically and practically before the work was commenced.

Mr. E. Makin (Welshpool) referred to mobile repair squads. The work carried out by these squads was a tribute to the labours of the former Mechanical Engineer to the Board, the late Mr. H. J. Ashwood, with whom he had been privileged to be associated for 17 years.

Mr. J. Woodcock (Colwyn Bay) referred to the estimates of gas demands and wondered whether these, as so often proved the case, were estimates which one assumed to be subject to modification or whether they were really targets that one could expect to be achieved.

Mr. Jones said it was naturally a prudent precaution to err on the high side in preparing estimates. The potential gas market—not forgetting the industrial gas field—justified the figures quoted.

Mr. B. Robertshaw (Pontypool) proposed a vote of thanks to Mr. Edwards for the great amount of work and trouble he had taken to prepare for the Junior Association so excellent and comprehensive a paper. In his vote he included Mr. Jones for having read the paper in Mr. Edwards' absence and having answered, along with Mr. Mason and Mr. Day, the questions asked.

Mr. J. Lomax (Rhyl), seconding, extended to the author the Association's and his own personal congratulations on the paper.

Jobs in New Industries

THE ANNUAL REPORT of the North East Development Association and the Northern Industrial Group states that the introduction of new industries to the North East has provided nearly 50,000 new jobs. The new industries are valuable assets, having a potential for expansion, but their effect is only slight compared with the number of people employed in basic industries.

'There may be a tendency,' the report goes on, 'to expect too much of the application of the development area policy for bringing about a really marked diversification in the existing structure of industry. Industrial change within the region is, in fact, bound to be a slow but continuous process, some of it natural through the normal development of the older-established industries and some directly due to the introduction of new firms or branches of industry from other parts of the country.'

An analysis of the employment situation shows that in the area as a whole the average number of unemployed during the year ended March, 1953, was 2.6%, compared with 2% for the country as a whole. The highest incidence (4.6%) was on Wearside, while South-West Durham and Darlington, with 1.8%, were below average. The report suggests that firms in the area could help to bring diversification on a local basis if they were prepared to look beyond their own immediate areas. It is worth the while of any firm contemplating expansion to give serious consideration to North-West Durham, where there will be a supply of excellent labour in the future.

Research is now being made into the operation of development area policy in the region to assess the effectiveness of the 1945 Distribution of Industry Act. Referring to the many firms which came into the area in the post-war boom, the report comments:

'How much of the movement was due to the favourable conditions of the time rather than to Government control of the location of industry is not easy to say. The present Government has declared its intention to continue the policy, which has always been on a non-party basis. There would appear, however, to be an increasing body of opinion that the policy should be changed or at least adjusted.'

The report criticises the Durham Division of the National Coal Board for failing to help by providing a forecast of the time, degree, and place of redundancy at the collieries.

UNITED STATES PRODUCTION in 1952 of all tars (coal tar, water gas tar and oil gas tar) totalled 820 mill. gal., a decrease of 12% on 1951, according to preliminary statistics by the U.S. Tariff Commission. The decline in output of tar which was particularly marked in the eastern part of the United States was attributed to further displacement of manufactured gas by natural gas, and to reduced output of tar by the coke oven industry in the early part of the year.

THE AUSTRALIAN SCENE

PRESIDENTIAL ADDRESS TO THE AUSTRALIAN GAS INSTITUTE BY

A. SPENCE,

General Manager, Newcastle Gas and Coke Co. Ltd., New South Wales.

IN the midst of our daily round it is desirable once in a while to pause to consider what our industry stands for, what it has achieved, and to hazard an informed guess as to what the future has in store for it. By reason of the amazing potential of this country, the almost revolutionary changes in its economic structure during the last decade, and the changes foreshadowed by science, such a pause is, indeed, needful.

Black coal is still the cornerstone of the industrial structure of this nation and is likely to remain so. A national fuel policy must be adopted wherein the greatest possible amount of useful heat and power is obtained from the available raw coal. The gas industry has a strong and undeniable claim on such a policy, in that it is able to transform up to 80% of the available energy in coal into gaseous and solid smokeless fuel, and those residual products which play so vital a part in the chemical economy of the country.

I suggest, therefore, that the gas industry should have reserved for its exclusive use the coal of the Greta seam, freely recognised as the best gas-making coal in the world.

Alternative Fuels

Estimates of the expected life of this field as at present utilised range from as low as 40 years to a maximum of 100 years. Is it not a criminal waste of one of our richest national resources to allow this coal to be squandered in railway locomotives? However, I must acknowledge that in the past few years there has been a belated recognition of the need to conserve Greta coal for gasification, and that some progress has already been made towards the carrying-out of the policy which I am advocating. The industry which can use this valuable national asset to best advantage is doing its utmost to conserve it by developing concurrently the gasification of brown coal.

I would refer to the important work now being carried out in Victoria, in the development of the scheme for the gasification of the brown coal deposits of the Latrobe Valley. The success of these efforts will have a resounding effect on the economy of that State and therefore ultimately on that of the whole country.

On the subject of alternative fuels, I would mention the growth in the use of propane and butane in the United States, in France and Canada, and also in Great Britain.

With the large oil refineries now projected for erection in Australia, I feel that we should watch these developments overseas with close interest, for, while one cannot predict at this stage what position they may eventually occupy in the gas industry of Australia, I believe that, providing propane and butane can be purchased at an economical figure, they can be utilised to advantage in a large number of the smaller undertakings in this country. Moreover, though many technical difficulties would probably have to be overcome, they could also occupy an important plane in catering for the peak loads of the major undertakings.

The Shadow of Nationalisation

The subject of nationalisation is, I am sure, in the back of all our minds these days. My term as Junior Vice-President of this Institute commenced during the first year of operation of the nationalised gas industry in Great Britain. During my year as Senior Vice-President, the Gas and Fuel Corporation of Victoria was formed, with the quasi-nationalisation of the major undertakings in that State. We all wonder if nationalisation will finally be the fate of the whole industry in this country. I believe that most of us here present do not want to see the day arrive when, in order to remain in the industry to which we have devoted the greater part of our lives, we shall be forced to accept complete dictation in all details from a governmental agency. We must guard against dangerous complacency developed by the thought, 'It won't happen until after my lifetime,' or an attitude of frustration, engendered by the difficulties in the way of private enterprise raising the capital necessary to cope with the huge expenditure which must be made by the industry if it is to supply the ever-growing demands being made upon it. With those faced with the problem of finding huge sums of fresh capital, I have sympathetic understanding, although I refuse to believe that it is beyond the capacity of private enterprise to provide those funds. Of course, the co-operation of a sympathetic legislature could be helpful in assisting the companies to borrow money in the usual way from the public.

Special Difficulties

It appears to me that the negative approach to this problem, which I find among some of our members, accepting as inevitable the ultimate nationalisation of our industry, is entirely wrong. We should take positive steps, as responsible members engaged in the industry, to help it to surmount the special difficulties of the period through which it is now passing. When they are surmounted, if we have the goodwill of all concerned, we shall find that a new era of increased development and prosperity lies before us.

A pertinent question to ask at this stage is, Has a nationalised utility service anything to offer the public which private enterprise, controlled by strict but sympathetically administered legislation, cannot provide cheaper and better? To get a very definite No! to this question, we have only to look at the results of nationalisation in the coal, electricity, gas, and transport industries of Great Britain. Do Mr. and Mrs. John Bull get their coal, their electricity, or their gas any cheaper? Does their travel cost them any less? Between them, these British industries have managed to raise prices with monotonous regularity ever since their becoming vested in the nation, at a rate which the Government would not tolerate in a privately owned utility. Perhaps then, Mr. and Mrs. J. B. are getting a better service for the increased prices they are paying? Ask them, and they will tell you that 'nationalisation' and 'restricted service' are synonymous terms.

Returning to sunny Australia, we find the cry for nationalisation of gas coming from two groups of people—one, the harassed housewives trying to budget within their husbands' incomes, with a pathetic faith in the ability of the Government to work miracles; and the other, the union officials, with Socialistic if not Communistic convictions, that private enterprise is the pad on which the 'boss' rides roughshod over 'the honest working man.' Could either group be further from the truth?

Working Partnership

Let us look at the increase in the price of gas since the end of 1939. My figures are obtained from my own Company's records, but they are fairly representative of the whole industry. In that time, the price of our gas has risen from 0.428d. to 0.878d. per unit, an increase of 105%. The two items forming by far the major part of our production costs are coal and labour. During the same period, the price of our coal has increased by 375% and the basic wage has increased by well over 200%. Surely, then, the housewife must agree that the privately-owned gas industry has more than done its part in damping the effect on her purse of the upsurge in the cost of all commodities which has occurred during and since the war.

I know there is still plenty of room for improvement

n the industry relationship between companies and their employees in the gas industry, but I believe that the personal contact between employers and employees possible under private enterprise can do far more towards producing real contentment among the workers than a purely wage docket relationship which is generally the only one possible between the State and its employees. The opportunity exists under private enterprise for a happy working partnership between the two parties, but it is a partnership in which both must accept their share of the responsibility for the development and prosperity of the industry.

Sharing Responsibility

This subject of sharing responsibility is one to which increasing attention will have to be given in Australia, in much the same manner as it has been given already in the United States. With very few exceptions, relationships within the gas industry in Australia have been harmonious, with resultant benefit to employees as well as employers. Here in Newcastle we are proud of the fact that we have not had one strike in our many years of service, but it is necessary that there should be a continuous effort to break down old-established prejudices in a practical manner, so that a sensible and feasible degree of management co-operation can be achieved. The proprietors should do everything possible to maintain and improve the standard of living of their employees. At the same time, in return for these higher standards, it should be constantly borne in mind by the men that a full day's work is essential if the industry is to support them. Management has an interest in the efficiency as well as the general contentment of employees.

Owing to the difficulties in obtaining adequate supplies of black coal from New South Wales, the principal companies in Victoria instituted an enquiry into the possible gasification of that State's large brown coal deposits. After a thorough examination of the question, it was established that it was scientifically possible and economically practicable to undertake this new project, but the capital cost was so great that the companies, after exhaustive endeavours to raise the required funds, found it necessary to invoke governmental aid. This resulted in the major companies in that State being subjected to governmental direction.

Quasi-nationalisation having taken place, whence will the necessary money derive? Either from increased taxation, which seems doubtful under the present set-up, or from public loans. If this latter is to be the case, why could not the industry have remained under the operational control of private enterprise, which is more flexible than public enterprise, and a system of amortisation been instituted by the Government whereby funds would have been made available to the companies at suitable interest rates for long-term repayment.

Interest of Private Shareholders

The interest of the private shareholders would have been retained in the direction of operations, and would have maintained a true commercial instinct governing all technical as well as financial decisions—an attitude generally foreign to state-controlled enterprise. So, while I wish the Gas and Fuel Corporation of Victoria every success, I also express the hope that the industry in the other States will continue under the control under which it has enjoyed so much success in the past.

Personally, I see no reason why any State Government should want to take over the risks and responsibilities involved in the heavy capital expenditure, as well as substantial maintenance and running costs required to render an adequate gas service to any city of substance. We share a general aim to give an efficient and effective service not only to industry but to householders, and I believe that Australian gas companies have not failed in the discharge of their obligations.

It should not be forgotten that in all States the gas industry is already subject to checks by Government that do not leave the maintenance of the high standards of service merely to the goodwill of the various companies. In New South Wales, for instance, Mr. W. Holman, the Premier of the day, introduced the first Gas Act in 1912 to safeguard public interest. This Act followed closely the English Act of that period. Several amendments have been made since, mainly to alter the rate of dividend to our shareholders. The principle of protection of the public has remained paramount. Strict Governmental control is exercised over all our activities.

The great demands which will be made on our industry in the future require that the industry should be strengthened by the enlistment of young engineers of the highest competence. As an industry, we must be in the van of the chemical and industrial advance which this country is making, and to this end it is imperative that recruits to the industry should be men of education, intellect, and character. As a corollary, they should be adequately reimbursed for their specialised knowledge and ability.

Cost of Distribution Systems

Gas engineers today are not only obliged to apply themselves to manufacture of gas; they have to be concerned also with its distribution. Modern road construction and the congestion of public utility services in principal thoroughfares are rendering it increasingly difficult and expensive to add to the number and size of mains in the inner areas, while the extraordinary growth of our population, bringing in its train an increase in home building in outlying districts, has meant that we have had to evolve methods of gas supply to meet the demand over much larger areas and further away from manufacturing stations. Not only must large sums be spent on trunk mains to take the supply to such outlying housing schemes, but as the number of houses to the acre is far less than in the more thickly populated inner areas, each consumer costs more to reach and equip. The industry must be prepared to supply such areas. I suggest that those directly engaged in the industry should lend their knowledge and ingenuity to devising means of cheaper distribution systems in the larger and less densely populated areas.

Work at the Fuel Research Station

BLENDING of coals for carbonisation to produce metallurgical coke has been one of the activities of the Fuel Research Board for some time. During 1952 (as recorded in the Board's latest report; H.M. Stationery Office, 2s. 6d., by post 2s. 7½d.) further experiments on a scale of carbonisation of several tons a day have shown that satisfactory metallurgical coke, as judged by the usual tests, can be made from blends of a first-grade Durham coking coal with as much as 50% of a weakly caking Northumberland coal. Experiments have also been made on the blending of gas-making coals with weakly caking coal for the production of domestic coke. The application of the results should assist in easing the difficulties of the supply of coal for making, not only metallurgical coke, but also coke suitable for domestic heating.

With increased mechanisation in coal mining, there is an inevitable increase in the proportion of coal of small size and higher ash content. Attention is being given, therefore, to the utilisation of these low-grade coals, particularly for the production of fuel gases. In preliminary trials with an experimental 'cyclone' generator, recently designed and constructed, in which the ash is removed as a molten slag, combustible gas has been produced from coal below $\frac{1}{8}$ in. in size, when gasified at high temperatures with air enriched with oxygen. The generator is now being adapted for similar trials with coke breeze, using air without the addition of oxygen.

The facilities provided by the 'calorimeter building' at the Fuel Research Station are unique. A series of investigations is being made on the room-heating efficiencies of different types of heating appliances, and on the effects of various factors on the more routine testing of appliances. In addition to the research work, many cookers, stoves, and grates have been tested at Greenwich, and at the Scottish Branch of the Fuel Research Station at Thorntonhall, near Glasgow.

The nation-wide survey of atmospheric pollution that is being carried out in collaboration with local authorities and others is steadily increasing in extent as more instruments for measuring the pollution come into use. Measurements made in London during the foggy weather of December, 1952, are proving of value to the medical authorities who are investigating the effect of atmospheric pollution on health.

RETORT HOUSE PRACTICE

PAPER TO THE MANCHESTER DISTRICT JUNIOR ASSOCIATION OF GAS ENGINEERS BY

D. B. STOKES,

Assoc.M.Inst.Gas E., Works Superintendent, Blackburn Undertaking, North Western Gas Board.

IT is said that one cannot make new out of old, but in this paper the author hopes to show that old foundations offer many avenues for investigation, the old foundations in this case supporting an equally venerable retort house. Whatever the shortcomings of plant erected when the continuous vertical retort was in its early stages of development, it is incumbent upon the technical staff to develop and improve, as far as is economically possible, technical operation and working conditions. The paper is largely a description of some of the aims and results achieved in the past two years in the retort house of the Blackburn undertaking.

The retort house at Blackburn was put into commission in 1920, having 12 beds of Glover-West continuous vertical retorts 33 in. × 10 in. × 20 ft. 6 in. long in beds of eight. Two years later the length of the retorts was increased to incorporate a steaming chamber to an overall length of 24 ft. 6 in.

Each bed was constructed with seven combustion chambers and three circulators in four sections and individual step-grate producers of traditional design were provided. The producer gas to each combustion chamber was controlled by movement of a block traversing a fixed port. Secondary air received little preheating, entering at the producer side of the setting and travelling upwards parallel with the producer gas uptakes. Top and bottom ironwork was of the original Glover-West design and little modification has been carried out in this respect since the retort house was first erected.

Coke handling ex retort house was effected by emptying the coke chambers at intervals of 1 hour 36 min. into 'boat' type skips, which were elevated by crane to concrete storage hoppers. The skips were unwieldy, requiring as many as six men to manœuvre. Only two running wheels were provided, with a small balancing castor at front and back.

The declared calorific value was 425 B.Th.U. per cu.ft., the calorific ex retort house being 435 B.Th.U. with a nominal throughput of 58-60 cwt. per retort per day and approximately 20% steaming.

Thermal Yield and Efficiency

It is generally recognised that gaseous thermal yield is not in itself a measure of works thermal efficiency and that a high gaseous thermal yield may not necessarily be indicative of overall thermal efficiency. Some 18 months ago it was decided to re-declare the calorific value at 450 B.Th.U., and much of the work described hereafter was undertaken to achieve the best possible results from an entirely new set of conditions. Accordingly, the deadline for the change-over was set for January 1, 1952.

From what at first sight and on many works would appear to be a simple matter of reorganisation, many difficulties arose. An average calorific value of 460-465 B.Th.U. ex retort house was fixed as a minimum aim, but this was only a preliminary, an even higher calorific value with external dilution being the ultimate intention. Basically, it is to be expected that an increase in calorific value will be synonymous with a drop in the steam to throughput ratio, but this will be attended by a drop in volumetric output. With the present level of capital cost of plant, and at a time when most carbonising plants are stretched to the limit, it is desirable to achieve the maximum volumetric as well as thermal output per unit of plant, particularly where the carbonising plant is to be run as base load plant. Hence, initially it was decided to leave the steam admission unaltered and work up the throughput to the maximum within the limits of the plant. This decision was governed by the fact that the labour force was exceptionally high in relationship to the capacity of the plant.

It is interesting to note the effect that an increase in throughput can have on the thermal output per man where the labour force remains constant for a given unit of plant. Consider the plant under review with an operational labour force of 71 men and a throughput of about 264 tons per day at 3 tons per retort. With a calorific value ex retort house of, say, 435 B.Th.U., the total thermal output per day would be, say, 23,760 therms. Now if the throughput be increased 25% to 3.75 tons per retort per day, with a calorific value of 475 B.Th.U. then the total thermal output per day would be 28,308 therms, an increase of 19.14% on gaseous therms, not taking into account any increase in coke production. With a cost of, say, 0.73d. per therm for carbonising labour on the lower throughput, this increase is reflected correspondingly on the above cost and gives a reduction of 0.17d. per therm. In plants similar to the one under consideration, where the labour force is relatively high, this effect is worth close consideration.

Problems Encountered

A number of problems were immediately apparent with the introduction of the increased throughput.

(a) *Coke Handling.*

The increased volume of coke discharged was unmanageable with the type of skip available. Two obvious means of overcoming this problem were firstly to increase the number of discharging periods per shift, and secondly to introduce a new design of skip. The former involved an increase in the labour strength, already high in proportion, and in no way improved the lot of the personnel undertaking the operation. Since the majority of the existing skips required replacement, the latter course was adopted. In the new design of skip the skip body lifts clear of the bogie, this feature more than compensating for the increased weight of coke discharged per draw. The operating mechanism for the bottom doors is simple in conception and easy to maintain. The skip has also a 25% increase in capacity over the original design. The bogie has ball-bearing mounted wheels and runs on rails concreted into the retort house floor.

(b) *Coal Travel.*

It was apparent in the early stages that the increase in throughput was causing trouble with retort working conditions, considerable 'sticking' taking place in the neck of the retort. After careful study of this problem it was thought that some benefit might be derived if the offcoming gas could be kept on the brickwork directly below the coal box. A long division or 'V' plate was tried and found most successful. The effect of considerable top sticking can be serious, causing pre-carbonisation on the ironwork and dry ascension pipes with heavy pitch deposition in the collecting mains. Also, the gas yield is seriously affected.

(c) *Effect of Hot Discharges and the Remedy.*

With the increased weight of coke discharged it was to be expected that the sensible heat of this coke would increase, it being borne in mind that the steam to coal ratio was now reduced. The effect of hot discharges in vertical retorts is manifold, some of the difficulties experienced at Blackburn comprising:—

(i) Distortion of worm shafts, requiring removal of extractor casting and replacement.

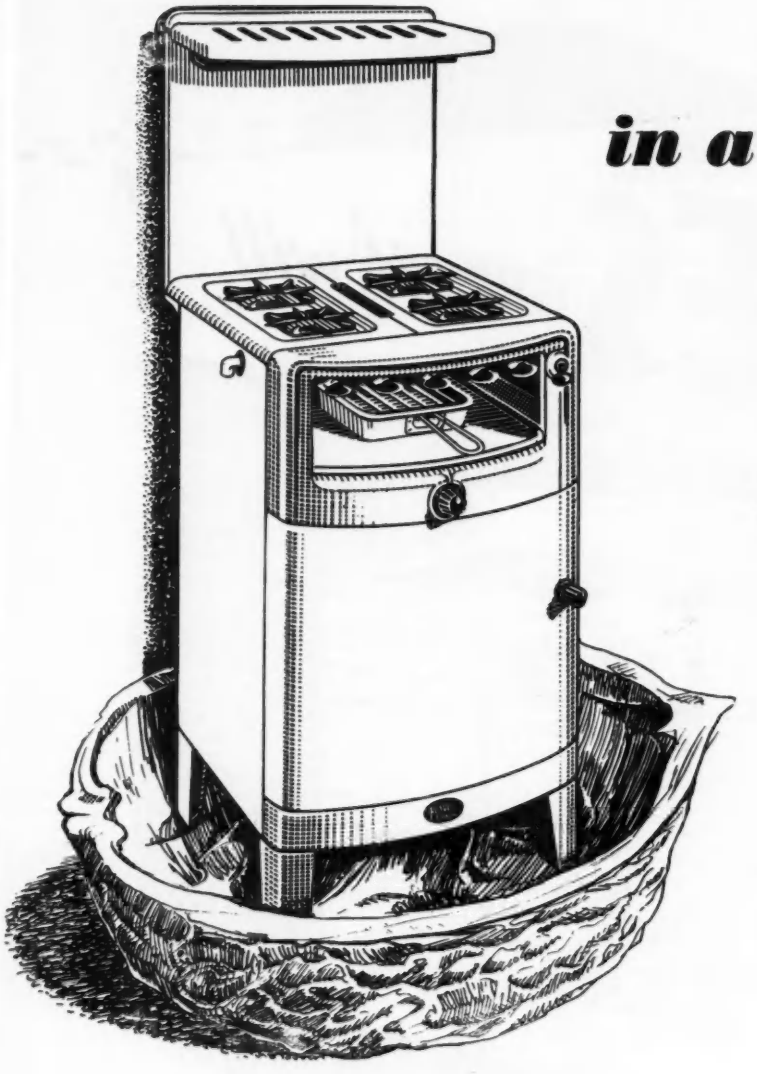
(ii) Excessive wear on retort mouthpiece packings with consequent air leakage and inestimable effect on gas makes.

(iii) Very heavy wear and tear on coke skips, side plates, and bottom suffering severe distortion.

(iv) Damage to coke bunkers and screening plant.

(v) The expense of quenching coke bunker fires represented by the employment of personnel and water costs.

(*Continued on p. 411*)



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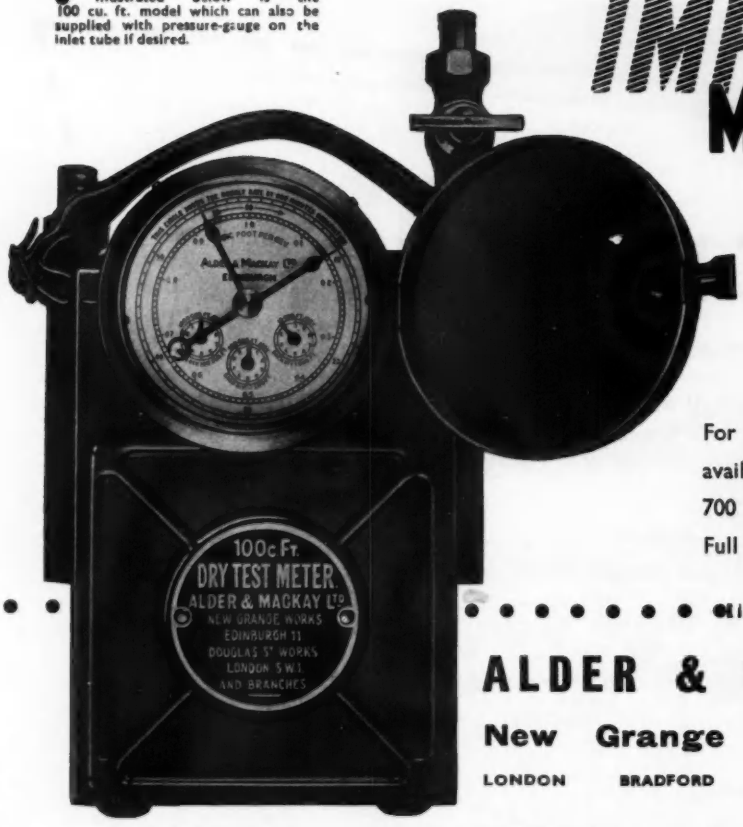

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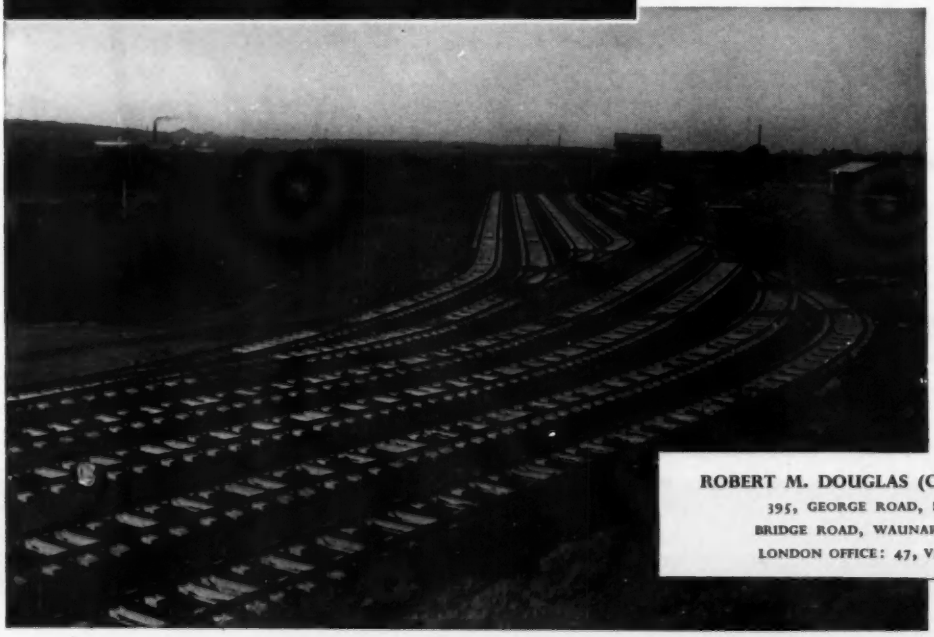

Photograph of the impressive Pollington sidings and screening plant constructed for the Directorate of Open Cast Coal Production of the Ministry of Works.

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(vi) The undesirability of increased moisture content of coke offered for sale.

(vii) Last, but not least, the effect on personnel of repeatedly being required to deal with coke fires, which are, of course, extraordinary duties.

It was decided, therefore, to investigate the possibility of fitting internal water sprays in the coke chambers. The idea in itself is not new, but owing to the design of the plant presented many opportunities for investigation. The aim was to produce a nozzle with a very wide spray angle and atomise the water effectively. It was thought that the finer the spray achieved, the more effective would be evaporation and consequently a smaller quantity of water would be required.

To assist the investigation, an old extractor casting was set up in a convenient position, and after many trials a nozzle was developed consisting of a spray head from a standard marketed product, brazed to a short length of ¼ in. bore steam tubing bent to give the required coverage. Eight of these were fitted to one bed of retorts to observe the effect of their introduction in practice. Sealed drains were fitted to the retort mouthpiece lids and tests made to ascertain the evaporation with varying quantities of water. It was found that, in normal circumstances, 7 gal. per hour was evaporated or absorbed with the coke discharged, but some allowance had to be made for water deposited on the comparatively cool sides of the coke chambers. For abnormal circumstances, a delivery of 11 gal. per hour was decided on finally. This excess water gives a good indication of door tightness.

A ¼ in. B.S.P. tapped hole was existing in all castings on opposite sides directly beneath the top flange, one of these holes normally being used for steam admission. Owing to the difficulty of drilling holes in the elevated castings in use it was decided to make use of the spare hole for this purpose. Unfortunately, owing to the restricted size of the opening, difficulty was found in placing and removing the nozzle described, and a firm specialising in the manufacture of spray equipment was approached to make up a spray of greater mechanical strength and of simple design.

The new design of nozzle consists of a brass adaptor which screws directly into the casting, with a stainless steel head. It contains two orifices, the first being set eccentrically to the second, giving a turbulent flow and delivering what is considered to be essential—a full cone spray as compared with a hollow cone spray. Owing to the small orifice size of the sprays, town water is used exclusively to overcome susceptibility to blockage. The water is supplied from an overhead constant head tank through a 3 in. bore asbestos cement pipe, individual supplies to each bed being run in ¼ in. copper. Suitable filters are fitted at two points in the main line. Much thought has been given to the material of which the sprays for coke chamber use are made, as the conditions under which they work are deleterious, serious erosion and corrosion taking place simultaneously. Taking the main factors of resistance to these effects into consideration, it would appear that an 18/8 stainless steel containing a minimum of nickel and approximately 18% chromium would give the best results.

As relaying of the retort house floor was considerably overdue, advantage was taken to provide proper floor drainage by setting channels between the skip track, these having a slight fall to an outside gulley, the floor on either side of the rails having an appropriate fall.

The installation and perfection of these internal sprays has proved most successful. Since installation there has been no appreciable evidence of hot discharging, and there has been no overheating of the bottom castings.

When the increased throughput was first introduced, a greatly aggravated dust nuisance was attendant, but this has been considerably reduced by internal spraying. The use of external sprays tended to over-saturate as well as to cause reduction in coke size. It was obvious that an excess of water was being absorbed by coke in the top of the skip in order effectively to quench the coke underneath. The use of the internal spray, while having little effect on coke sizing by reason of its atomised nature, has virtually eliminated the need for external jets. It is too early to ascertain what effect the introduction of these sprays will have on the internal corrosion of the extractor castings, but it is thought that, if care is taken to keep air leakage to the minimum through the bottom castings, very little trouble will be experienced.

Re-zoning of Heats.

Considerable heat input was desired to overcome the increased requirements due to the overall increase in total throughput—viz., steam and coal. On the other hand it was found necessary to eliminate the use of the bottom combustion chambers owing to the increased sensible heat carried down to this level of the retorts. In addition, it was found necessary to reduce the temperatures in the second combustion chambers to 1,150°-1,200°C. to minimise the risk of overheated castings.

To achieve the necessary heat input, careful re-zoning of the heats was undertaken and a higher average temperature was found necessary. The limits under which we are now obliged to work are narrow and require careful supervision. Also the siliceous material with which the settings were constructed is being replaced with a 95% silica material as resetting becomes necessary, and this will allow more latitude in respect of heat input within safer working limits. A description of the new material is given later.

One rather interesting modification which has been undertaken is the replacement of P.G. nostril dampers by graded nostrils which are, of course, more in keeping with modern practice and assist materially in the maintenance of constant heats.

Heats Control

The control of heats on the earlier installation of continuous vertical retorts is something of a problem, there being as many as 90 different points of control on each bed in regular use. Obviously, therefore, where the carbonising engineer is faced with a problem of this nature it is of prime importance to develop a method of control which will simplify and at the same time achieve even results. No attempt will be made in this paper to offer any conclusions in this respect, as it is appreciated that there is considerable diversity in design from one works to another, local conditions also being a contributory factor.

It is thought that where lambent heating of retorts is practised, considerable divergence of total throughput—viz., steam and coal—may be apparent. This presumably is on account of the fact that difficulty is experienced in maintaining a level balance of temperature throughout the length of a combustion chamber, and accordingly the retorts further from the point of initial combustion may tend to issue smoky discharges. Consider what the effect of this divergence of throughput may be. It is not uncommon in continuous vertical retorts of similar design to find a difference of as much as 25% in the throughput of retorts from back to front of a setting. Also, the throughput is usually calculated on the performance of the whole house. Hence it is reasonable to assume that where the average throughput is 60 cwt. per day, it is possible for as much as 68 cwt. to pass through one retort while as little as 52 cwt. may pass through another.

Too much attention cannot be given to the control of heats with the aim of attaining even temperatures along a chamber, and it is thought that a little more application of common-sense and a little less consultation with a contractor's instruction book will produce much better results in control.

Retort Life

(a) Previous to the commencement of these investigations, the retorts were, without exception, constructed in a siliceous material. Now a material of this nature, although having a reasonably high mechanical strength at relatively low carbonising temperatures, deteriorates rapidly at higher temperatures and becomes subject to serious face erosion. On numerous occasions the author has had occasion to examine the face of brickwork put off for cold patching, and has found evidence of serious scoring, particularly in the zones of maximum temperature

and where the major proportion of the steam reaction is assumed to take place.

When it became necessary to increase the heat input to the settings it followed that increased maximum temperatures were required with consequent increase in internal retort wear. As an extended programme of resetting was under way, a new material previously mentioned of 95% silica composition was introduced. The relative composition of the new material is given in Appendix 2.

(b) In addition to the resetting of the beds, every opportunity was taken to ensure that the necessary cold face patching of the existing material was carried out to prolong their life until resetting could take place. Also a strict routine of scurfing is adhered to, any sign of leakage being dealt with immediately. Briefly, the routine consists of a 35-day scurfing schedule. After scurfing, retorts are airborne sealed to a minimum of 6 in. W.G. and a maximum of 8 in. W.G. Any difficulties in achieving this are located and corrected before putting the retort back to work, whether the defect is in brickwork or ironwork. Any holes which cannot be sealed effectively by airborne sealing are welded. Where possible the defect is also treated from the combustion chamber side with a refractory cement gun.

It is thought that often insufficient attention is paid to bottom ironwork leakage. This can cause serious local internal heating, in addition to the more obvious effect on gas composition. This may be particularly noticeable where retorts are working under a low steam/coal ratio.

Criticism may be levelled at the cost of undertaking intensive retort sealing of this nature, but it is interesting to note that on a works producing 6 to 6.5 mill. per day of coal gas, the saving of ½ therm per ton by this means represents the saving of £550 per annum, and by no means takes up the whole time of an operator. There can, of course, be no criticism of such work. This duty is in fact undertaken by the heats attendant at Blackburn.

Although it may not always be practicable on smaller works, it is suggested that scurfing be undertaken in units where temperatures may be readily controlled. Care must be taken to ensure that local overheating, in addition to high internal retort temperatures, does not cause damage to the retort face.

(c) The introduction of water sprays has been of great benefit in more than one respect, but of course the total weight of steam admitted will be little different from that admitted prior to their introduction. Accordingly, a further investigation was carried out with two main objects: Firstly to reduce steam admission to prolong retort life and offset the increased wear and tear of high throughputs; and secondly to produce maximum possible calorific value ex retort house.

Owing to the tendency for hot bottom castings it was not possible to reduce this amount of steaming, particularly in view of the fact that the bottom combustion chambers had been closed off and second combustion chambers reduced in temperature. We had, in fact, reached a position of stalemate. An experiment was conducted with a bed almost due for resetting to examine the possibility of utilising the now useless bottom combustion chamber as an air circulator to preheat the secondary air and further to reduce the risk of overheated bottom castings. The waste gas uptake at the level of the second combustion chamber was sealed by cutting away the wall on the non-producer side and inserting a damper. The inspection box at first combustion chamber level, producer side, was removed and a duct cut to the main secondary air intake. The sight hole box at first combustion chamber level, non-producer side, was replaced by an adjustable air intake slide. With the above modifications, the temperature of the air admitted was raised to approximately 600°C. No difficulty was found in maintaining any desired level of heats.

Results far exceeded expectations and no operational difficulties were encountered. Steam, other than generated from water sprays, was entirely eliminated; heats control was improved; fuel to producers was reduced (see Appendix 1); there was probability of increased retort life; it was possible to increase second combustion chamber to 1,300°C., thus regaining some effective retort length; and retort running conditions were improved.

Dr. S. Pexton, in his paper on the 'Fuel Requirements of Carbonising Plant,' makes particular note of the design changes in continuous verticals with reference to the preheating of secondary air. Many of the older designs of Glover-West settings were formed with straight retorts and secondary air preheating. Later designs incorporated a steaming chamber to the exclusion of air preheating, other improvements in design being largely nullified by the loss of recuperation. Reference is also made to the fact that trouble is experienced with overheated bottom ironwork when making high calorific value gas. Figures are given to show the relative difference in producer fuel consumption on 'straight' and 'bell-mouthed' retorts, a matter of 12% reduction in fuel consumption, and it is interesting to compare these results with the calculated reduction given in Appendix 1 of this paper relating to our own case.

Where the policy seems to be leaning to the production of high calorific value gas ex retort house, it is thought that close attention should be paid to the possibility of returning to earlier designs. I refer this point to our planners.

The modifications and developments described have eliminated the generation of steam in solid fuel boilers other than for standby use and in exceptional circumstances. Steam to the retorts is generated solely by utilising the sensible heat of the hot coke prior to discharge. In practice, with 12 beds under fire, the saving in steam by utilising the sensible heat of the coke to generate steam to the retorts, combined with the elimination of externally generated steam by conversion of the bottom combustion chambers, amounts to over 5,000 lb. of steam per hour. This is equivalent to the output of two Lancashire boilers appropriate to this size of installation when burning coke breeze.

Heating-up of Settings

It is usual, with settings of this type, to follow the pattern of heating-up recommended by the contractors. The new material now in operation is particularly subject to thermal shock, as is the case with most refractories of similar composition. It was thought, therefore, that the usual methods were too loose in their conception and left the setting particularly prone to local heating or shock cooling. After a prolonged investigation the following method was adopted:—

(i) *Drying Out.*—The usual method of inserting a brazier for drying-out purposes is followed for a period of 10 to 12 days. Plugs and sight holes in circulators are left open and retort mouthpiece doors cracked. All air ports are fully opened. In short, every effort is made to reduce humidity within the settings.

(ii) *Heating-up.*—The aim of this method is to heat up the setting through all stages up to gaseous firing, maintaining temperatures in every chamber and along the length of the chambers in close relationship.

It was thought that the best way to achieve this objective was to limit the flow of gases through the bed, or, in other words, to pressurise it by limiting the openings where the gases can escape. Accordingly all air intakes, sight holes, and waste gas dampers are closed and sealed. Producer dampers are left fully open. Thermocouples are inserted in the 1st, 3rd, 5th, and 7th combustion chambers and under the waste gas dampers at the producer side. A thermo-recorder is used for the producer gas uptakes. Prior to inserting the first bar in the producer, a temperature survey is made of the setting. Nostril plugs are clayed in position in the sight plugs under the waste gas dampers of a size which causes a slight pressure at bottom combustion chamber level.

Where a new bed has been built alongside a working bed it is usual to find that chambers nearest to the working bed will be at a higher temperature. The procedure then is to limit the flow of gases through this section until even temperatures throughout have been attained. This may be achieved by further reducing the nostril size under the waste gas dampers, also by reducing the size of the producer gas nostrils.

Assuming that the temperature in the producer gas uptake is 90°C., when the first bar has been inserted, and that the final temperature at gaseous firing is 650°C., the procedure then is to allow the 560°C. difference to be taken up at the rate of 20°C., each day over a period of 28 days. To facilitate this a 'teller' line is drawn on the chart of the recorder in the producer gas uptake and operators are instructed to follow this carefully. Care should be taken that thermocouples are kept clear of the brickwork and measure the temperature of the gases in the setting.

Temperatures are taken daily at each point, making a total of 20 readings in all. To facilitate the taking of these temperatures each couple is wired to a 24-point rotary switch, which is in turn wired to the indicator. The system is made up as a unit and numbered to correspond to the chambers and can be transferred complete to any bed. Periodically, temperature checks are carried out within the retorts by suspending a sheathed thermometer approximately half-way down the retorts. It is found that there is usually a lag of anything up to 80°C. in the retorts nearest to the non-producer side, but as this is constant at all levels the whole of a retort will be affected and it is thought that no adverse conditions appertain. It appears that little can be done to overcome this lag.

The retorts are 24 ft. 6 in. in length, which is slightly less than usual for this size of retort, there being four fewer courses of hard brickwork forming the floor of the bed than is normally the case. To minimise the effect of the losses through the floor, beds are screened to prevent circulation of cold air around bottom castings and brazier fires are set immediately under the major axis of the bed. Two courses of insulating bricks are laid on the brickwork at top of stack level. It is difficult to see how these heat losses may be further reduced without major constructional modifications which would entail great expense.

The setting is soaked after gaseous firing for a minimum period of seven days at temperatures slightly lower than normal scurfing temperatures.

A decrease in the rate of expansion is shown at a temperature between 290° and 325°C. This occurs to a greater or lesser degree in every case and is probably due to a characteristic of the silica material.

Routine Testing

It is surprising how many works regard the retort house as a Cinderella when planning a programme of routine testing. Half-hearted attempts are made to introduce chemical control but this is usually confined to coal analyses interspaced with periodical gas analyses of one sort or another. Is that routine? Again, it is usual to bring into operation the ill-used Orsat for these analyses, samples usually being taken in quantities of 200 c.c.'s or less. Spot sampling of crude gas is utterly useless to assess the performance of a plant. Is it reasonable to expect that a sample of gas of a volume normally associated with gas analysis apparatus and probably collected over a matter of seconds can give any sort of reliable result?

It was with these thoughts in mind that an endeavour was made to find some means of assessing at any time, and over any period, exactly what was happening on any section of the gasmaking plant. Accordingly, an old 5 cu.ft. Bezant sampler was borrowed from another works, and in conjunction with a disused 5 cu.ft. meter test holder was installed in a vacant corner of the retort house. Test lines were run to a few collecting main offtakes and a Boys calorimeter and complete gas analysis apparatus were set up nearby. Results from this rather crude arrangement were most encouraging and an ambitious programme of routine testing was evolved to cover all aspects of the retort house. The aim was to cover, as fully as possible, the processing of the coal in the retort house and ascertain accurately the performance of the plant under the entirely changed set of conditions occurring with the higher throughputs.

A range of tests which were considered to be most useful for routine performance and applicable to the operation of the retort house was devised and simplified as far as possible. A report sheet to give a full picture of a set of conditions was made up. For easy reference it was desirable to log routine tests, with modifications to controls, etc., on a flow sheet where results can be seen at a glance. This can be arranged very simply for flue gas testing and for day-to-day calorific value tests made on crude gas, but it would be a cumbersome system to log results the nature of which are set out on the report sheet which was formulated. A standard method of sampling was evolved for comparison purposes, as far as possible resembling the British Standard on both coal and coke. A system to measure throughput was devised and found successful. In order to assess any variation between beds in this respect a similar pattern of measurement is used in every case.

Possible Future Policy

Much of the work described in this paper has been the direct consequence of conforming to a general policy of base loading the retort house and producing high calorific value gas with external dilution. The outcome has been to increase saleable coke production which unfortunately has outstripped demand, and latterly has come the reduction in coke value. As there does not appear to be any likely improvement in this situation in the foreseeable future, it is probable that steps will have to be taken to limit coke production to saleable proportions.

Briefly, the present method of working diluent plant has been governed largely by gas demand, with blue water gas having precedent over producer gas; the former being somewhat cheaper to work. In this respect it should be pointed out that our cost of blue water gas manufacture does not include steam, which is entirely generated by waste heat and would otherwise be lost. Under stable gas demands blue water gas is first diluent. Producer gas is used for low outputs. Under peak outputs carburetted water gas plus blue water gas and/or producer gas is admitted.

Any future policy should, if possible, encompass the advantages of the present policy. These may be summarised as follows: Flexibility of gas output; thermal efficiency; flexibility of calorific value control; and economic considerations.

The problem is a difficult one but offers two possible solutions: Firstly to revert to the former policy of high steaming in the retort house with peak demand being taken up with carburetted water gas; and secondly to base load blue water gas, with fluctuations in demand being taken up by the retort house plus more blue water gas and/or carburetted water gas and producer gas as necessary.

The former policy has little to commend it technically or economically in our case, many of the advantages of the present method of working being lost. Moreover, the increased amount of steam required to make the lower calorific value ex retort house would necessitate the working of solid fuel boilers with consequent increase in steam costs relating to water gas manufacture, in addition to the inevitable increased use of gas oil for carburetted water gas manufacture.

It would seem, therefore, that the second policy offers greater possibilities. This is borne out even further when it is remembered that as coke prices fall so will the cost of water gas be reduced, and with high coke stocks this is a point worth considering. Another point is clear, should the latter policy be adopted, producer gas as a diluent will become a mere stop-gap. However, as a producer gas plant can be worked well under its rated capacity quite efficiently, its use as a controller of calorific value may be more apparent. Used for this purpose a producer gas plant is most uneconomical when consuming coke of domestic size, but it is possible to work effectively with de-dusted breeze, the 0-¼ in. sizes being removed; and when reclaiming unscreened coke from stock, it will serve to control the breeze thus produced.

To some extent any policy such as outlined is complicated by the fact that there is an intermittent intake of coke oven gas of high calorific value which, when holding high gas stocks, may embarrass accurate assessment of

(*Continued on p. 416*)

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production and necessitate more diluent gases. Normally, producer gas would be the obvious diluent, but in the circumstances described, flue gases could be admitted to advantage rather than for short periods shut down what is essentially base load plant.

Control of Labour

Technical papers are in sufficient profusion to crease the brow of harassed technical personnel, but rarely is there any mention of the work which often takes up 50% of the technical officers time—that of labour control. (It is perhaps debatable nowadays whether the technical man controls the labour force or whether the converse is true.) The author believes that no one wishes to return to the days where queues were the order of the day outside most gasworks gates, but feels that a greater sense of responsibility could be shown by the worker who enters them. A man's interest in, and regard for, his place of work are surely synonymous with his being part of a contented labour force. Facilities and working conditions in the majority of undertakings leave much to be desired, and this is particularly true of some of the older works. Much has been done latterly to improve the lot of the worker, but it is thought that not enough is done in many cases to foster appreciation of improvements. In our own case a much closer relationship has been established between men and management by provision of better messroom and canteen facilities which were, to say the least, most inadequate.

It would be impossible to expect the technical officer to spend his day giving 'pep' talks to his personnel, a job which can be done in a far more pungent manner by his foremen. It is suggested, therefore, that every care is taken in selecting men for senior operative positions. It is also essential that promotion is wherever possible from the ranks employed by the undertaking on a basis of merit, not necessarily seniority. We cannot expect to attract and hold the conscientious and ambitious worker if there is no promise of future reward for his enthusiasm, nor does it follow that because a man can, under supervision, effectively rod a retort that that man will in course of time be able to supervise the work of his fellow-beings. The technical man must make it his business to know his men individually, to know something about their background, home life, and temperament.

APPENDIX 1

Dr. S. Pexton ('Fuel Requirements of Carbonising Plant') gives figures for the heat output of a step-grate producer working with continuous vertical retorts, and I include certain of his findings upon which to base the calculated saving of heat input to the settings with recuperation of secondary air to 1,012°F. (600°C.)

	Therms per 100 lb. dry coke to producers
Output	
Heat of combustion of producer gas (net)	8.89
Latent heat of water of combustion	0.34
Sensible heat of hot producer gas	2.56
Latent heat of undecomposed steam	0.50
TOTAL	12.29 therms

Thermal output at 15 lb. coke per 100 lb. coal carbonised at 76 cwt. per retort per day = 1,253.6 therms.

Producer gas yield per 100 lb. of dry coke to producers = 8,420 cu. ft.

Then total gas yield per producer per day =

$$\frac{10{,}200 \times 8{,}420}{100} = 858{,}840 \text{ cu. ft.}$$

Air required at 10% excess = 90.5 cu. ft. per 100 cu. ft. of producer gas

$$= \frac{858{,}840 \times 90.5}{100} = 777{,}250 \text{ cu. ft.}$$

Assuming that one-third of this air is supplied as tertiary air, then secondary air required (preheated to 1,012°F.) will be 518,166 cu. ft.

Heat content of secondary air between 60°F. and 1,012°F. = $518{,}166 \times (1{,}012-60) \times 0.0204 = 100.63$ therms

Percentage reduction in heat required as supplied to producer

$$= \frac{100.63}{1{,}253.6} = 8.02$$

Allowing for partial breeze removal from coke to producers, average yard price for fuel as supplied to producers = 75s. per ton.

The net calculated saving with average of nine producers working =

$$\frac{10{,}200 \times 9 \times 365 \times 0.0802 \times 75}{2{,}240 \times 20} = £4{,}498 \text{ p.a.}$$

APPENDIX 2

Details of Old and New Retort Material

Siliceous		
Silica	88.29%	Refractoriness—under load of 28 lb. per sq. in.
Alumina	9.24%	Subsidence 1,430°C.
Iron oxide	0.73%	Failure 1,530°C.
Titania	0.89%	Loss on ignition 0.14%.
Lime	0.38%	Refractoriness safety test (no bending) Cone 27.
Magnesia	0.19%	Fusing range (no lead) Cone 30/31.
Alkalis	0.29%	After expansion at 1,410°C. (2 hours) 0.25% exp. Sp. Gr. 2.56. True Porosity 26%.
Silica		
Silica	95.50%	Refractoriness—under load of 50 lb. per sq. in.
Alumina	1.00%	Failure at 1,690°C.
Iron oxide	0.50%	Pyrometric Cone equivalent—Cone 33.
Titania	0.20%	After expansion—1,410°C., *Nil.*
Lime	2.00%	Sp. Gr. less than 2.35.
Magnesia	Trace	Porosity 26%-28%.
Alkalis	Trace	

EASTERN JUNIORS

At the annual meeting of the Eastern Junior Gas Association held at King's Lynn, the President, Mr. J. Anderton, presented his annual report for 1952-53, following which the Hon. Secretary, Mr. R. Hilham, announced the elections for the session 1953-54:

President: F. J. Denny.
Senior Vice-President: R. F. Robinson.
Junior Vice-President: F. G. Cox.
Members of Council: W. W. Patterson, G. A. Woodwark, D. F. Rudge, and S. R. D. Southgate.
Hon. Secretary and Treasurer: R. W. Hilham.
Asst. Hon. Secretary and Transactions Secretary: R. C. Arnold.

On the proposition of Mr. F. G. Cox, seconded by Mr. W. W. Patterson, the following members were re-elected Education Committee representatives:—E. S. Dennis (Council Representative), K. W. Hudson, and E. H. Winch.

On the proposal of Mr. R. C. Arnold, seconded by Mr. R. F. Robinson, Messrs. Benstead and Stanley were re-elected Auditors.

In proposing a vote of thanks to the retiring President, Mr. F. J. Denny expressed the Association's thanks to Mr. Anderton for upholding the standards set by his predecessors, in spite of the fact that he had had extra work and worry due to the floods in his home town. Mr. Anderton briefly replied, expressing his thanks.

Alderman R. Turner, Chairman of the Eastern Gas Consultative Council, then addressed the meeting, his subject being 'The object and operation of gas consultative councils.' Alderman Turner's address was warmly received and Mr. R. W. Hilham proposed a vote of thanks, which was carried with acclamation.

In expressing the thanks of the Association to the Eastern and East Midlands Gas Boards, Mr. E. H. Winch said the Association's appreciation of the support given by the gas boards was very sincere. They also appreciated the interest taken by the divisional general managers and the local managers, who were responsible for the detailed arrangements.

Mr. F. W. Morris, Member, Eastern Gas Board, replied to the vote of thanks.

Afterwards, members and their ladies were guests of the Eastern Gas Board at lunch, when the President called upon Mr. R. A. Weston, General Manager, Norwich Division, who extended a welcome to the Association.

Wales Gas Board Development Plans

THE Wales Gas Board hopes to see completed shortly a number of important negotiations which have a direct bearing on its plans of development. This was stated by the Chairman, Mr. T. Mervyn Jones, when he presented a report on these plans to the Wales Gas Consultative Council at Tenby on July 20. He said the Board was proceeding with the South Wales grid (eastern section) but final developments of the gas supply in that area depended on settlement of terms and conditions from coke oven owners.

The Minister of Fuel and Power had called for and had received separate schemes from the Gas Board and from the N.C.B. (who controlled the Nantgarw and other coke ovens). Now the matter was subject to any action which he might decide to take under the powers conferred on him by the Gas Act, 1948. It was understood that additional quantities of gas might become available from other coke ovens in this area. If offered to the Board at prices enabling it to compete with other fuels the Board was sure there would be a demand for it.

Margam Coke Oven Gas

The main source of supply for the western section was the coke oven plant of the Steel Company of Wales, Ltd., at Margam, where the Board had a present contract for 6 mill. cu.ft. a day. The Board was now negotiating to increase that to 14.4 mill. and, in addition, to arrange to take 3.6 mill. cu.ft. from the Steel Company's new cold reduction plant at Velindre near Swansea. There were one or two outstanding matters, but one part of this arrangement had been agreed on—namely, payment. The price to be paid by the Board for the gas would at all times be in accordance with the realisable value of the gas in the districts where it was being taken. In the Board's view that was sound commonsense.

A firm offer had been received from National Oil Refineries, Ltd., for the supply of what Mr. Jones termed 'quite considerable' quantities of 'tail' gas. The company said any arrangements with the Board would be limited to five years, for they took into account technical and commercial alterations in processes at the refinery which might be directly related to the use of this type of gas. One of its features was that it had a higher calorific value than that of normal town gas, and also a different chemical constitution.

For the time being it had to be considered less in terms of a basic source of supply and more as a gas for a special use. It might well be disposed of through special mains to particular types of industrial consumers and not reformed and made available for domestic use. This was a question governed by the Company's terms; the Board had an open mind on it. There were times, particularly at summer week-ends, when the ovens of the Steel Company of Wales would be producing more gas than what was in immediate demand. For that reason, the Board had approached the British Electricity Authority with a proposal to pipe some surplus gas from Briton Ferry to the Tir John power station.

Referring to liquefied petroleum gases, Mr. Jones said the Board had decided, owing to costs, to proceed with limited developments only for the installation of L.P. gas/air plants at Fishguard and Llanidloes. The establishing of undiluted propane plants at Presteigne and Tumble was being examined.

Propane Plants

He believed that, costs permitting, there was no reason for propane plants not being established at small undertakings that could not be reached by the grids. There were signs that the availability of propane was going to be greater than ever before in Britain, and the pilot butane/air plant at Whitland had proved how satisfactory a change to an L.P. gas could be technically.

Agreement had been reached in principle with a steel company, John Summers & Co., Ltd., on the purchase of substantial quantities of gas from their coke oven plant at Shotton, North Wales. They had informed the Board they had available 4 mill. cu.ft. a day.

Subject to receipt of a letter, agreement had also been reached with the Coal Board for the purchase of methane from Point of Ayr colliery with a view to its treatment and distribution in the North Wales area.

With the completion of these negotiations provision of a grid scheme for this area could be accelerated.

Uniformity of prices, he told a questioner, was the Board's aim, but it was not immediately practicable because of the great differences in the prime costs of getting gas to consumers. A common source and common prices was the Board's object and that would probably be reached in certain stages.

As soon as the agreements he had referred to were fully settled the Board intended to get on with the job of introducing new tariffs in the grid areas. These would, of course, come before the Council.

A suggestion that there should be co-operation at consumer level between the different fuel industries so as to effect economy in the use of fuels was submitted by Mr. E. T. Kinsey Morgan (Radnor County Council).

Mr. Morgan said there was little access to the Ministry of Fuel and Power from the consumers' viewpoint, and he was wondering whether something could not be formed representative of the consumers of gas, electricity, etc.

He was perturbed, for one thing, at futile competition between the fuels. He contended that waste resulted through, say, gas and electricity both being used in certain services where gas could be employed to the better purpose. Conversely, gas could bow to electricity in other spheres. He did not want to eliminate competition, but sought to get the best use of fuels by avoiding unnecessary duplication.

Some doubt arose in the meeting about whether it was within the Council's power to deal with the matter, but discussion led to Mr. Morgan being invited to put his idea in writing in time for it to be considered at the next meeting at Wrexham on October 13.

Mr. Morgan is also a member of the South Wales Electricity Consultative Council.

Janet Jones of Wales

The Welsh Tourist and Holidays Board has appointed Miss Janet Jones, of Abergynolwen, as official hostess and ambassadress for tourism in Wales. Miss Jones is a student of the University College of Wales, Cardiff, an accomplished harpist, and singer of Welsh folk songs. Her duties involve the welcoming of tourists to Wales and representing the Tourist Board both at home and later on abroad. Recently she visited the Wales Gas Board headquarters where she was met by Board members and representative heads of Government Departments and others interested in tourism in Wales. Our photograph shows Miss Jones pointing out her home on the map to Mr. T. Mervyn Jones, Chairman, Wales Gas Board, Mr. R. S. Snelling, Deputy Chairman, and Mr. Lyn Howell, Secretary, Welsh Tourist and Holidays Board.

North Thames Consultative Council

THE North Thames Gas Consultative Council, at its last meeting before the summer break, expressed its appreciation of the action of the North Thames Gas Board in providing every member with a copy of the report of the Gas Industry Productivity Team on its visit to the United States. The report, it was stated, was being closely studied by the Board, and it was hoped that at a later meeting the Chairman or some other representative of the Board would address the Council on the implications of the report from the North Thames point of view. A member of the Council commented on the excellent compilation of the report and suggested that congratulations should be sent to those responsible for writing it.

Mr. E. Bayliss, Chairman, reported on a meeting of chairmen of all the consultative councils with the Minister of Fuel and Power, and said one matter discussed was the question of secretaries. In their own case they were very well satisfied with their present secretary, Mr. W. Elliott, who took up his duties while still in the employ of the Board. He had since retired, but had continued to serve the Council well, and there was no reason to question his loyalty to the Council. It had been agreed that it was desirable that consultative councils should meet at premises other than those of the boards—a practice followed by the North Thames Consultative Council from its inception.

An Ilford member suggested that it was about time the Minister of Fuel and Power was told that the Domestic Coal Consumers Council was redundant. He was referring to a complaint about new arrangements in the Lea Bridge district for paying for coke. In the past consumers had been allowed to pay the carman on delivery, but notice had been given that in future all payments were to be made either to headquarters or at the local offices. The consumer had been told that coke complaints should be addressed to the Domestic Coal Consumers Council.

The Chairman said the Coke Manager, who controlled coke deliveries, was employed by the North Thames Gas Board, and it was preferable that comments on the arrangements within the area should come to the Gas Consultative Council, although it was true that the Domestic Coal Consumers Council did, in fact, deal with some aspects of coke.

The following statistics relating to gas sold (in therms) in the groups represented by divisional committees for the quarter ended March 31, 1953, were submitted:

Berkshire and Buckinghamshire group: Domestic, 3,961,511 (=62.2%); non-domestic, 2,341,182 (=36.8%); public street lighting, 61,771 (=1.0%); total, 6,364,464.

Middlesex and Surrey group: Domestic, 21,425,633 (=63.3%); non-domestic, 11,794,455 (=34.8%); public street lighting, 607,460 (=1.9%); total, 33,827,548.

Metropolitan group: Domestic, 25,982,587 (=46.2%); non-domestic, 29,382,202 (=52.2%); public street lighting, 869,411 (=1.6%); total, 56,234,200.

Essex group: Domestic, 16,529,103 (=67.8%); non-domestic, 7,604,018 (=31.2%); public street lighting, 259,998 (=1.0%); total, 24,393,119.

Total: Domestic, 67,898,834 (=56.2%); non-domestic, 51,121,857 (=42.3%); public street lighting, 1,798,640 (=1.5%); total, 120,819,331.

Coke Sales Circle

THE following officers of the London and Counties Coke Sales Circle have been elected for the year 1953-54: *President*, Sir John Charrington; *Chairman*, D. G. Rose; *Vice-Chairman*, L. Curry; *Secretary*, T. G. Meyrick. Four members of the Management Committee have retired on completion of their period of office and C. A. Deas, F. W. Freeth, A. E. Jarman, and W. J. L. Morrison have been elected to fill the vacancies for a term of three years.

The summer meeting of the Circle consisted of a visit to the Fuel Research Station of the Department of Scientific and Industrial Research. A party of 70 members departed from Westminster Pier and travelled by river to Greenwich, where, by permission of the South Eastern Gas Board, they were allowed to land at the Greenwich jetty. On arrival at the Fuel Research Station the party was addressed by Dr. A. Parker, Director of Research.

The party was divided into 10 groups, each group being taken on a tour and given an opportunity of inspecting a number of the research projects being investigated. These included the domestic appliance testing laboratories, the calorimeter rooms, the smoke preventing doors for shell type boilers, the coke breeze producer, and atmospheric pollution laboratories.

During the afternoon tea was provided by the Department of Scientific and Industrial Research, at which Mr. D. G. Rose (Chairman) proposed a vote of thanks to Dr. Parker and his staff.

Canadian Exhibition

FOR the first time since the war there will be official British Government participation in the 74th Canadian National Exhibition at Toronto from August 28 to September 12.

Claimed to be the world's largest annual exhibition, it represents the products of agriculture and industry of Canada from the Atlantic to the Pacific coast; there is also a pavilion where British goods are shown. The annual attendance is in the region of 2¼ mill.—more than twice the population of greater Toronto.

The British display, called 'From Britain,' will comprise a selection of contemporary products of United Kingdom manufacturers. At one end will be a main display of a variety of British products, and at the other end four windows will show men's clothes and suiting cloths, together with appropriate accessories. The two sides of the stand will accommodate three box displays of travel goods, sports equipment, kitchenware and dining room equipment. Long lengths of furnishing fabric will be displayed on the walls, and the curved end-walls will contain a montage of newspapers, posters, and material describing Britain and her products.

The United Kingdom exhibit is sponsored by the Board of Trade, and the items have been selected by the Council of Industrial Design, the British Vogue Export Book, and the Colour, Design, and Style Centre of the Cotton Board. About 250 United Kingdom firms will be sending out some 520 exhibits.

New Gas Stock Issue

LISTS opened and closed on August 7 for a new issue by the Gas Council of £80 mil. 4% guaranteed gas stock, 1969-1972, at an issued price of £99%.

Applications for amounts of stock up to and including £250,000 were allotted in full, and applications for larger amounts received about 75% of the amounts applied for. Allotment letters were posted the same night by the Bank of England.

Interest will be paid on February 8 and August 8. The proceeds of the issue are to be used to repay temporary borrowing (amounting on July 30 to £58,580,000) by the Gas Council on behalf of the 12 area boards, to meet capital expenditure incurred by the Council and the boards, to provide working capital, and for other authorised purposes. The stock is to be redeemed at par not later than August 8, 1972, but may be redeemed at par in whole or in part, by drawings or otherwise at the option of the Gas Council, on or at any time after August 8, 1969, on the usual notice.

The Gas Council has already issued £229 mill. 3% guaranteed stock, 1990-1995, of which £189 mill. was issued at par as compensation to holders of gas securities on the nationalisation of the industry in 1949, and £40 mill. to the National Debt Commissioners in May, 1949, at 100½. There was a further issue of £75 mill. in 3½% guaranteed stock, 1969-1971, at 98 in July, 1951.

Finchley Housing Estates

TWO ESTATES completed and occupied are among a number of schemes designed by the Finchley Borough Council to accommodate applicants from the council's housing list. The smaller of the two comprises five blocks of two-storey flats consisting of four flats per block. Up to the present, only four blocks have been completed and occupied, the construction of the fifth having been held up pending the demolition of an old house on the estate.

The ground floor flats comprise one bedroom, living room with dining recess, kitchen and combined bathroom and W.C., while those on the upper floor have an additional bedroom. A space for prams, fuel, and dustbins for both storeys is provided on the ground floor in the main structure. In all flats the kitchen and bathroom are adjoining. The hot water in most cases is provided by a Main M.1 multipoint gas water-heater installed in the kitchen which supplies the sink, bath and toilet basin. Of the gas cookers installed three out of every four are Main's cookers.

The second estate consists of 64 two-storey flats and 12 two-storey houses. The houses are in two terraces of six, comprising large living room and kitchen on the ground floor, bathroom, separate W.C., and either three or four bedrooms on the first floor. The bathroom in each house is situated immediately over the kitchen, the hot water being supplied by means of a Main M.1 multipoint gas water heater in the kitchen to feed the sink, with a rising service pipe to the bath and toilet basin in the bathroom above.

The flats are in blocks of four, and are all of the two-bedroom type, with large living room, kitchen with bathroom adjoining. Most kitchens are equipped with a Main M.1 multipoint gas water heater which provides hot water at all the taps in the flat.

Mainlaying Problems Solved

THE Metal Box Co., Ltd., London, is erecting a factory at Weasenham Lane, Wisbech, and gas will be used extensively for process work in the manufacture of tin cans and boxes, also for water heating and canteen requirements.

To meet the heavy demand for gas it has been necessary to lay a 12 in. feeder main to the boundary of the factory and a 10 in. service main into the factory itself. When laying this main along Victoria Road and under the level crossing, many various types of objects were found, some of antique value. The Cambridge Division *Gas Bulletin* of the Eastern Gas Board says it appears that the course of the new main followed an old ditch which had been filled in approximately 100 years ago, the filling consisting of cockle, winkle, and mussel shells and old pottery and various odds and ends. The best exhibit was a bowl, which was deposited in the local museum.

An old medicine bottle was marked 'Dicey & Co., 10, Bow Churchyard, London, True Daffys Elixir,' which is said to have been a nursery medicine, regarded by Thackeray as old-fashioned, in a novel, round about 1815.

The laying of the main under the main March-Wisbech line was carried out on a Sunday. Railway employees began removing the necessary sleepers at 4 a.m. and the Board's men started work at 6 a.m. The job was finally completed and all the sleepers relaid by 9 p.m.

Amongst the problems faced by the Gas Board's distribution engineers at Wisbech is the fact that the town is divided by the River Nene, and intersected with numerous level crossings and canals. The crossings of some of these obstructions with large size mains are often difficult. One of the most recent jobs carried out at Wisbech was the laying of a 10 in. main across the bridge over the River Nene in the centre of the town.

At this bridge, where seven streams of traffic converge, the control is accomplished by traffic lights. The organised chaos rendered by this main laying necessitated that the traffic lights should be put out of commission, and policemen took over. Many times when traffic bottle-necks occurred the latter were not available and Mr. Dick, the Wisbech Distribution Superintendent, stepped into the gap. Rumour has it that the police were so impressed by his handling of the traffic that they are trying to recruit him into the special constabulary.

Mr. J. Hunter Rioch, Cambridge Divisional General Manager, Eastern Gas Board, presented special long-service certificates to two old Royston employees at the local office. They were Mr. Harry Hawkes (79), who retired last year after 41 years' service, and Mr. Ernest Thomas Law (72), retiring after 32 years' service. The presentations were made in the presence of the other employees of the Royston works, introductions being made by Mr. R. J. Gavin, the Royston Manager.

Steady Progress is being made in Fife on the plan to link the new town of Glenrothes with Kirkcaldy, giving a grid service from the latter works through the centre of the county. A new 15 in. medium pressure main is being laid to the new town, which is at present drawing supplies from Markinch, the nearest larger centre. As the town will become one of the largest centres in the county, the intention is ultimately to service it from the grid. The present work is designed to keep pace with the growth of the town and to ensure complete service throughout the period of expansion. New plant is being installed at Kirkcaldy to meet the increased load, which has been intensified by a considerable expansion of housing in the town itself as well as by servicing of some smaller adjacent centres where old gasworks have gone out of use.

Radio-Equipped Mobile Showroom

MOBILE gas showrooms were coming very much into fashion 14 years ago but the war years halted their progress, and under the changed conditions since nationalisation only a comparatively small number have been introduced. The North Western Gas Board has now brought the idea of mobile service completely up to date by introducing a two-way radio-equipped showroom which it claims is the first of its kind in the country.

The showroom, which is 22 ft. long, 7 ft. 6 in. wide, and 10 ft. 6 in. high, contains 16 gas appliances, five cookers of different types and makes, a refrigerator, washing machine, three radiators, two fires, a sink unit, and three water heaters. An office is incorporated at one end, where a compact two-way radio unit is installed, and the vehicle is equipped with 80 gal. of water, and calor gas. Many of the appliances are live, and demonstrations of cooking and washing can be given. The showroom is hauled by a detachable bantam tractor, giving an overall length of 33 ft. 7 in., and it is staffed by a home service adviser, a salesman, and a driver.

The unit, which was formally opened on July 31 by Alderman H. N. Bewley, Chairman of the Liverpool Housing Committee, on its first tour of duty on a housing estate sponsored by his committee, is designed to meet the needs of large housing estates which are being built in many parts of the Gas Board's area. Many people who come to view the houses do not have time to visit the gas service centres. In the mobile showroom they will be able to inspect a comprehensive range of appliances and make their decisions on the spot. Because of the two-way radio system installed, the Board can afford to the public from the mobile showroom precisely the same service as is provided at fixed premises.

COMPANY NEWS

METERS, LTD.

The final dividend of Meters, Ltd., for the year ended March 31, 1953, is 6%, the same as for the previous year, making 10%, the same as a year ago. Consolidated trading profit was £98,302 (against £119,286) and other income £4,627 (£7,161). Consolidated net profit was £24,183 (£41,627)—after tax of £48,136 (£52,209), depreciation £13,080 (£15,459) and directors' remuneration £17,530 (£17,152). The carry forward, after providing for dividend was £21,528 (£16,470). Group stock £260,703 (£278,533) and debtors £95,485 (£205,241) Creditors £51,512 (£101,091), loan nil (£20,000), overdraft £18,716 (£61,272).

POWER GAS

To finance the major part of capital expenditure of the Power-Gas Corporation, Ltd., over the next two years, the directors are negotiating with Morgan Grenfell & Co., with a view to a private placing of £800,000 unsecured loan stock. Dr. N. E. Rambush, Chairman, says in a circular to shareholders that the company is carrying through the second phase of the works development programme. This involves construction of a new heavy machine shop and extension of a constructional shop recently erected at Bowesfield Lane, Stockton, estimated to cost some £600,000. During the next 18 months it will also be necessary to spend approximately £200,000 on modernisation of the existing plant at Parkfield works. A 50% scrip issue is proposed, Treasury consent having been obtained, involving capitalisation of £333,333 of capital reserves. The issued capital is now £650,000, but will be raised to £666,667 by the allotment of £16,667 shares to owners of the remaining one-third of Rosedowns Holdings in addition to the cash payment of £118,200. Such holders will participate in the scrip issue.

YORKSHIRE COPPER WORKS

The directors of the Yorkshire Copper Works, Ltd., have decided to pay a Coronation bonus of one week's wage to the employees of the company, and at the same time pay a Coronation bonus to the ordinary stockholders of 5% subject to tax, as an interim dividend, in respect of the year to July 31, 1953, as the company has had a satisfactory year. Unless anything unforeseen happens, the same dividend and bonus as last year, amounting to 15%, subject to tax, will also be recommended to be paid in January, it is stated.

RUBBER COMPANIES

The directors of the North British Rubber Co., Ltd., and the Dominion Rubber Co., Ltd., announce that the sales and branch service organisations of the two companies have been consolidated to give more efficient service and a quicker distribution of goods both at home and overseas. The North British Rubber Co. will undertake the distribution in the United Kingdom of all products previously handled by the separate sales divisions of the two companies. The Dominion Rubber Co. will undertake the distribution of North British and Dominion products overseas. The products of both the companies will be manufactured at Castle Mills, Edinburgh, and Heathhall, Dumfries, where during the last few years the most modern equipment has been installed for the production of tyres, footwear, mechanical and general rubber goods. The consolidation will enable the North British Rubber Co. to render greatly increased service to the home market, and the Dominion Rubber Co. to accelerate development of overseas markets and contribute more effectively to the export drive.

Trade News

An 'All-Night' Fire

ILLUSTRATED HERE is the Sutton No. 2 Mk 11 all-night fire. This appliance incorporates a cast-iron plate, normally concealed behind the front of the grate, which can be raised when it is desired to bank up the fire for overnight burning. A back boiler can be fitted to supply hot water for domestic purposes. A built-in gas burner is a feature of the appliance, which is very simple to install. —*Radiation Group Sales, Ltd., (Solid Fuel Division), Birmingham Production Centre (Eagle Range and Grate Co., Ltd.), Aston, Birmingham, 6.*

Glopane Stoving

FROM CORROSION, LTD., we have received details of an entirely new type of zinc-rich anti-corrosion paint which the firm has introduced under the name 'Glopane Stoving.' This is a metallic zinc coating for iron and steel applied by normal stoving technique. In the particulars we have received the firm points out that the most effective anti-corrosion protection for iron and steel consists of a metallic zinc coating. The universal use of hot-dip galvanising testifies to that. Hot-dip galvanising is, the firm adds, a difficult process demanding considerable knowledge and experience and capital in the form of equipment and metal. It is also a relatively expensive process for other than standardised production. It is claimed that by the use of 'Glopane Stoving,' it is now possible to apply a zinc coating by the conventional paint stoving technique.

'Glopane Stoving' gives the authentic electro-chemical protection of a metallic zinc coating. If the coating is scratched through to the underlying iron or steel, then in contact with moisture an electro-chemical cell is set up in which the iron or steel is the cathode and is not attacked. The zinc is the anode in this system, and is sacrificed in preference to the steel. Thus, cracks or 'pinholes' in the coating may result in local rusting, but there can be no spread of rust under the coating.

'Glopane Stoving' coating therefore acts in exactly the same way as hot-dip galvanising and the other types of metallic zinc coating.

The methods of use and physical properties of 'Glopane Stoving' are briefly described in the literature. The concentration of metallic zinc in the coating is very high, being 93% by weight of the dry coating. It is not necessary for the surface to be given any chemical pre-treatment—wire brushing or sand-blasting is sufficient. The coating is applied by brushing, spraying, or dipping, by ordinary paint techniques. Any desired thickness of coating may be built up by the application of successive coats of the material. When brushing or dipping, the previous coating should be allowed to become touch dry before the next is applied. When spraying, wet on wet application is permissible.

Brushed or dipped coatings are touch dry in about 20 min. after application. Sprayed coatings are touch dry in less than 5 min. after application. Coated articles may be handled at the touch dry stage.

Stoving temperatures. The following are alternative stoving times and temperatures:

Single-coat system

300°F. (149°C.)	...	60 min.
350°F. (177°C.)	...	30 min.
375°F. (191°C.)	...	20 min.
400°F. (204°C.)	...	15 min.

Two-coat system

First coat—10 min. at 300°F. (149°C.)
Second coat—30 min. at 350°F. (177°C.)

The coating results in a matt mid-grey finish, and the stoved coating gives an excellent 'key' for decorative finishing coats.

Used at a coverage of 500 to 600 sq.ft. per gal. (10 to 12 sq. m. per litre), the coating contains about two-thirds of an ounce of zinc per sq.ft. of surface covered (equivalent to about 200 grammes per sq. m.). A zinc coating of this thickness will give long-term protection even under exacting conditions.

'Glopane Stoving' coating adheres tenaciously to the iron or steel surface to which it is applied, is extremely hard, but does not lose flexibility. It is unaffected by temperatures up to 480°F. (250°C.) for short periods, or by temperatures up to 300°F. (150°C.) for continuous exposure.—*Corrosion, Ltd., 16, Gloucester Place, Portman Square, London, W.1.*

'Epping Auto-Shunter'

AN IMPROVED shunting tractor manufactured by Epping Engineers, Ltd., is now available.

Powered by a diesel industrial tractor engine, the 'Epping Auto-Shunter' is designed to move loads of up to 150 tons on straight level rail. For this purpose particular attention has been paid to correct weight distribution as well as to the design of the front axle assembly, since it is felt that if a machine of this type is to be 100% effective, it must also be capable of crossing over rails and points.

Shunting by means of pneumatic-tyred tractors is by no means new, but the recent march of mechanical handling progress within the factory has tended also to focus attention on the dock or factory siding with the result that the advantages of employing the more effective modern version of the shunting tractor are becoming more widely recognised.

Even where the volume of the traffic or the particular nature of the siding may prevent this machine from supplanting completely other more conventional methods the advantages of freedom of movement and versatility of the machine will commend its use for supplementary duties.

Being quite independent of the rail yet at the same time able to cross over the track, the 'Epping Auto-Shunter' can be immediately positioned for work whenever and wherever the need arises. In addition to normal shunting or towing operations of rail-borne traffic, the machine can be pressed into service as an ordinary industrial tractor. After taking initial and annual wear and tear allowances into account the capital cost of the machine in the U.K., we are informed, represents no more than a weekly outgoing of between £2 and £3 depending on the period of depreciation. On the operating cost side approximately 5s. per hour should suffice to cover the cost of fuel and the driver's wage, as well as provide for regular maintenance and ultimate engine and tyre replacement.—*Epping Engineers, Ltd., 73, Lindsey Street, Epping, Essex.*

Below: The Epping Auto Shunter

PUBLISHERS' NOTICE

The " Gas Journal " is published every Wednesday, price 1/3d.; by post 1/5d.

Subscription Rates: Home and Empire:—52/- per annum; Foreign:—60/- per annum. (Both payable in advance.) A copy of the " Gas Journal " Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements: All small classified advertisements are charged at 1/9 per line (approx. 7 words)—minimum charge 10/6. A Box Number address occupies 2 lines, and a further 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

Displayed Advertisements: Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received 14 days prior to publication if proofs are required. Type area of inside pages 10" deep × 7" wide; block screen 120.

BUSINESS MANAGER: S. T. CULLEN

MIDLANDS OFFICE: 10, Union Street, Birmingham.

NORTHERN MANAGER: W. Q. Foster, 33, St. Helens Road, Harrogate. *'Phone:* Harrogate 84291.

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.

Telephone: CENtral 2236-7. *Telegrams:* Gasking, Fleet, London.

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APPOINTMENTS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18–64 inclusive or a woman aged 18–59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

NORTH WESTERN GAS BOARD, FYLDE GROUP, BLACKPOOL, require three FIRST CLASS GAS FITTERS. Applicants must hold the City and Guilds Full Technological Certificate in Gas Fitting. J.I.C. Schedule rates of pay.

Applications to be addressed to the Personnel Officer, Fylde Group, North Western Gas Board, Princess St., Blackpool, and received within fourteen days from the publication of this advertisement.

J. G. O. Drake,
General Manager

NORTH WESTERN GAS BOARD

PRINCIPALS OF TRAINING CENTRES

APPLICATIONS are invited for the pensionable appointment of PRINCIPAL at each of the Board's Training Centres at Liverpool, Manchester and Preston.

The commencing salary will be not less than £1,000 per annum.

The duties will include liaison with local technical colleges, participation in the recruitment of apprentices and pupil engineers, supervision of pupil engineers and the operation of their training schemes, and responsibility for apprenticeship and pupilage agreements, trainee records, time-tables, syllabuses and examinations.

Each Principal will be expected to lecture to pupil engineers and others on gas engineering (manufacture or supply).

Applicants must have held a responsible post in industry and should possess a University degree and/or be a corporate member of one of the professional engineering institutions.

Detailed applications, giving the names of two referees, should reach the Secretary, North Western Gas Board, 60, Whitworth Street, Manchester, 1, within fourteen days.

NORTH WESTERN GAS BOARD

WIRRALL GROUP

CARBONISING SUPERINTENDENT

APPLICATIONS are invited for the above pensionable appointment at a salary within Grade A.P.T. VIII (£585–£665 per annum).

In the first instance the position will be held at the Wallasey Works.

The successful candidate will be fully responsible to the Station Engineer for the technical control of the gas making plant, comprising continuous vertical retorts and modern C.W.G. plants.

Detailed applications, giving the names of two referees should reach the General Manager, North Western Gas Board (Wirral Group), Hind Street, Birkenhead, within 21 days.

WEST MIDLANDS GAS BOARD

BIRMINGHAM AND DISTRICT DIVISION

CHEMIST—SWAN VILLAGE WORKS BIRMINGHAM DISTRICT

THE POSITION is on the staff of the Divisional Chief Chemist.

As a minimum qualification candidates must have passed the Intermediate B.Sc. or equivalent examination, and should have had several years experience of the chemical control of Gas Works processes.

The salary will be within Grade VII (£545–£625 per annum) of the National Salary Scales for Gas Staffs.

The post is pensionable and the successful candidate may be required to pass a medical examination.

Applications, stating age, personal details, particulars of training, experience and qualifications, together with the names of two referees, should be addressed to Mr. J. E. Wakeford, Divisional General Manager, West Midlands Gas Board, Birmingham and District Division, Gas Offices, Edmund Street, Birmingham, 3, to reach him within fifteen days of the appearance of this advertisement.

F. H. Cureton,
Secretary to the Board.

WEST MIDLANDS GAS BOARD

WORCESTERSHIRE-HEREFORDSHIRE DIVISION

DISTRIBUTION SUPERINTENDENT—KIDDERMINSTER DISTRICT

CANDIDATES should have had experience in high and low pressure supply and in the preparation of estimates and specifications for all classes of distribution work and preferably possess the Higher Grade Certificate of the Institution of Gas Engineers in Gas Engineering (Supply). The Superintendent will be responsible for the efficient conduct of all aspects of a distribution department including sales promotion.

The salary for the post will be within Grade VIII (£585–£665 per annum) of the National Salary Scales for Gas Staffs.

Housing accommodation, at a reasonable rental, may be available, if required.

The post is pensionable and the successful candidate may be required to pass a medical examination.

Applications, stating age, qualifications and experience, together with the names of two referees, should be addressed to Mr. C. F. W. Rendle, Divisional General Manager, West Midlands Gas Board, Worcestershire-Herefordshire Division, 12, St. Nicholas St., Worcester, to reach him within fifteen days of the appearance of this advertisement.

F. H. Cureton,
Secretary to the Board.

(Classified advertisements continued on page 422)

APPOINTMENTS VACANT (ctd.)

APPLICATIONS ARE INVITED from suitably qualified SENIOR and JUNIOR TECHNICAL ASSISTANTS for the position of Site Engineers which includes supervision of the construction and the testing of gasworks plant. Apply in writing in the first instance to :—Tully, Sons and Company, Newark, Nottinghamshire.

TWO FIRST CLASS GASFITTERS urgently required. Full J.I.C. rates of pay (Provincial 'A') and Conditions of Service. Newly built housing accommodation in the Corby New Town Development Area will be made available at appropriate weekly rental. Applications stating age and giving full details of qualifications and experience should be forwarded without delay to the Group Manager, East Midlands Gas Board, 40, High Street, Kettering.

EAST MIDLANDS GAS BOARD

LEICESTER & NORTHANTS DIVISION

SHOWROOM SUPERINTENDENT—NORTHAMPTON UNDERTAKING

APPLICATIONS are invited from suitably qualified persons for the position of SHOWROOM SUPERINTENDENT at the Northampton Undertaking.

Applicants must have had considerable experience of Showroom supervision, appliance sales and consumer service, and be well versed in window and general display practice.

The appointment will be made in Grade A.P.T. VIII (£585–£665 per annum) and the commencing salary will be in accordance with the experience and qualifications of the person appointed.

The successful candidate may be required to pass a medical examination, and unless already subject to a pension scheme by virtue of the Gas (Pension Rights) Regulations, 1950, will be required, if eligible, to join the Board's Staff Pension Scheme within six months from taking up the appointment.

Applications stating age, experience and qualifications and giving the names of two referees should be addressed to the undersigned to be received not later than Thursday, August 20, 1953.

H. B. TAYLOR,
Divisional General Manager.

Gas Offices,
Millstone Lane,
Leicester.
July 31, 1953.

WALES GAS BOARD

ASSISTANT INDUSTRIAL GAS ENGINEER—NORTH WALES

APPLICATIONS are invited for the above appointment within the salary range of A.P.T. Grade Xa (£665/765 per annum). Applicants should have had considerable experience in the installation and operation of large scale catering appliances, hot water and central heating installations and other commercial and small industrial gas appliances, and should possess the Higher Grade Certificate of the Institute of Gas Engineers (Supply) or equivalent qualification. The successful applicant will be required to pass a medical examination and to subscribe to such scheme of superannuation that the Board may adopt.

DISTRIBUTION SUPERINTENDENT—EBBW VALE & BEAUFORT UNDERTAKING

Applications are invited for the position of Distribution Superintendent of the above Undertaking within the Staff Salary Scale A.P.T. VIb (£475/£555 per annum) inclusive. A house is available at Beaufort.

The post will be a progressive one and the applicant must be able to supervise major extensions to the gas distribution system and to take charge of the fittings and maintenance staff in an area where considerable scope for expansion exists.

Applicants should possess the following qualifications or their equivalents:

(*a*) London City and Guilds Final Certificate in Gas Fitting.

(*b*) London City and Guilds Certificate in Gas Technology of Supply.

The successful applicant will be required to pass a medical examination and join the Board's Superannuation Scheme.

Applications, giving details of age, qualifications and experience, together with the names of two referees, should reach the undersigned not later than August 31, 1953.

C. B. MAWER,
Secretary to the Board.

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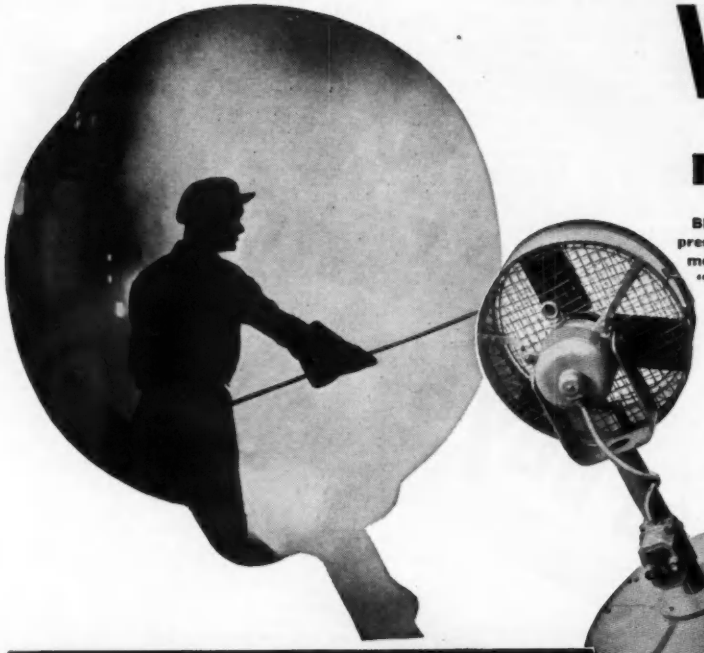

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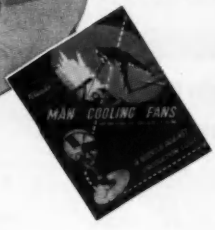

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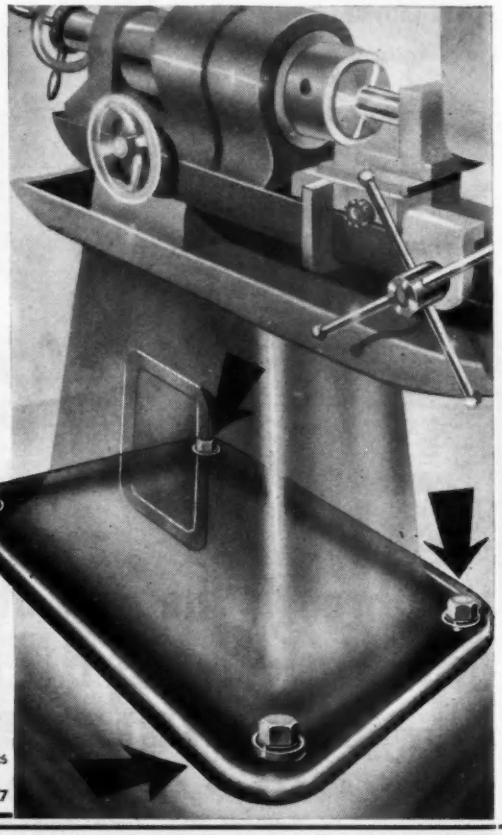

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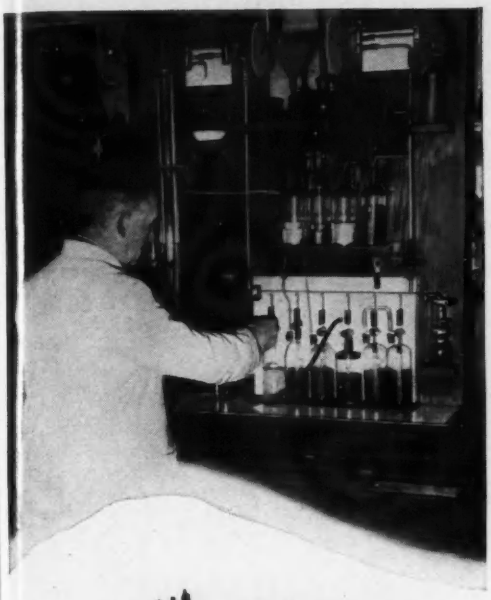
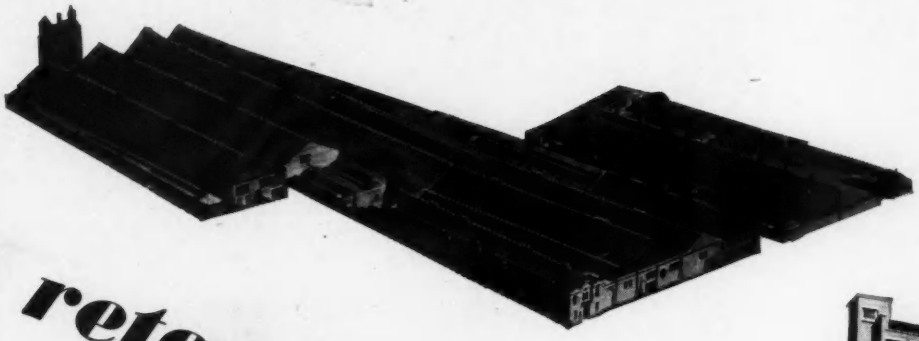
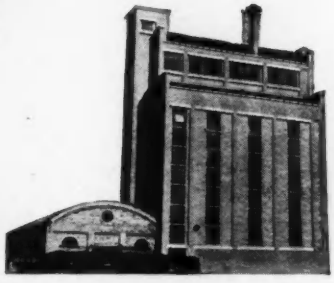


research plant



to retort house



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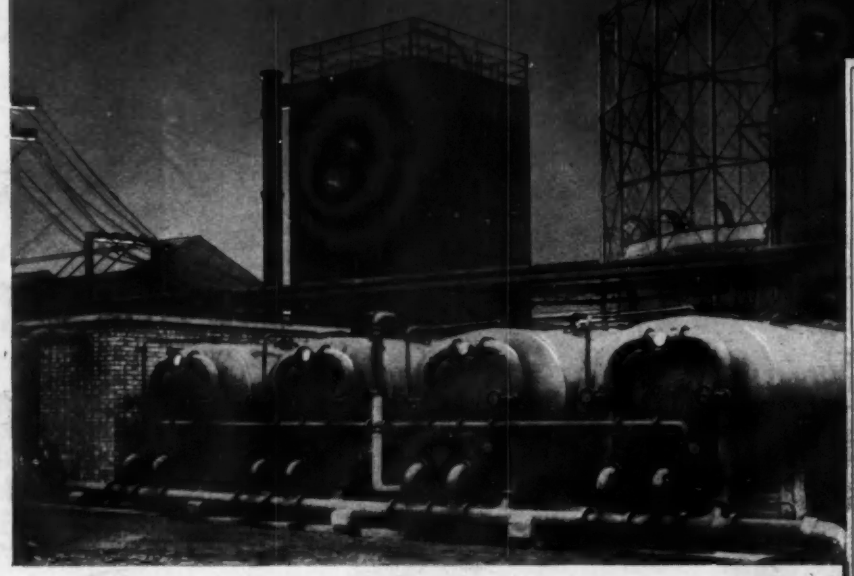
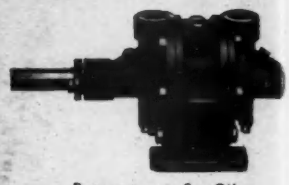
Pulsometer

PUMPS AND FILTERS

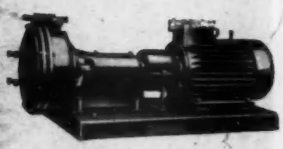


Filtration Plant in Gasworks

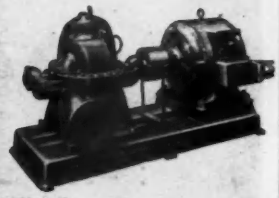
The illustrations show centrifugal pumps for light and heavy oil and liquor duties, stoneware and special metal pumps for handling acids and alkalis, pumps for circulating and washer duties, for clean water and fire services and for liquids containing abrasives.



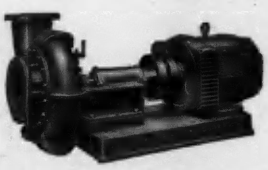
Rotary pump for Oil transfer duties.



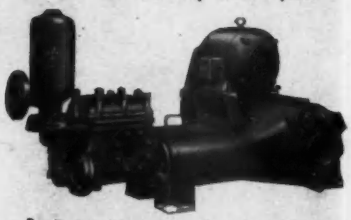
Stoneware pump for Corrosive and chemicals.



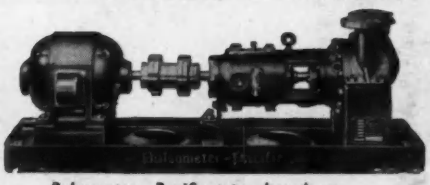
"HS" Type—for water services. All heads up to 500 feet.



Slurry pump for coal washing and abrasive liquids.



Reciprocating pump of modern design for Gas Works.



Pulsometer—Pacific type, based on latest American practice.

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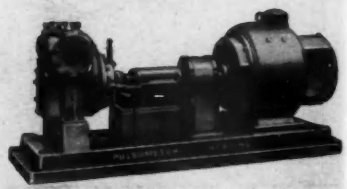

Self priming centrifugal pumps.

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